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MAJOR L. A. MERILLAT, Sr., V.C., N.A.
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PIERRE A. FISH, Editor **ITHACA, N. Y.**

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WORK AND WIN

In some ways the past year has been one of the most critical in the history of our country. It is not impossible that still more critical times are before us. Aside from the activities of the war itself and our preparation for it, there have been corresponding activities in the production of food supplies, which are quite as essential as munitions for prosecuting a vigorous campaign. There has been cause for congratulation and for apprehension. Congratulation for increased productivity under unfavorable conditions, and apprehension for the increased demands made upon our resources. The world may be upon the edge of a famine. Nearly thirty million men are at arms; think what that means to the farms. With lessening man-power to operate the soil, there is an ever increasing demand for its products. It has been said there are three important factors in this war: money, munitions and food. Money and munitions have been and can be provided, but food production cannot be forecast with any degree of certainty even in times of peace and with sufficient labor. Feeding a large share of the world is the task that is facing us. Wheatless and meatless days are not merely a matter of philanthropy; the conservation of our food is a grim necessity and upon it depends the future of our country and probably much of Europe besides.

If arms represent our first line of defense, it is obvious that farms constitute our second line of defense. Now, more than ever, do armies march upon their stomachs, and America must provide a victorious diet for them. An army represents not only the soldiers at the front but a vast number of men and women at home working to supply their needs—and all must be fed and clothed.

Every nation in Europe is on a war diet and this country is rapidly approaching it. The question of food winning the war looms larger. The enemy is endeavoring to starve the Allies by submarining their food ships. The Allies are blockading the food from the enemy, and the surrounding neutral nations are under pressure to export whatever surplus they may have both ways.

The past year has been devoted largely to preparation and to rendering aid to our allies who have been defending us. The time is rapidly approaching when we can participate in our own defence. Moral and financial aid were at once available and promptly rendered. Physical aid, from a peace-loving nation unprepared for war, required time. Once awakened to the danger threatening democracy, preparation has moved with accelerating speed; but the battle front indicates that still more speed is needed.

One of the cogs in the war machine is veterinary service. Although recognized by Congress a year before the declaration of war, its organization has proceeded slowly. Its complete organization has not yet been announced; but veterinarians have rallied to the service and there is no lack of support where patriotism calls. The supply has been equal to the demand and can be increased if necessary. The test, however, is yet to come. The success of the veterinary branch of our army will depend upon the merit shown in the present war. The necessity of veterinary service has been amply demonstrated in other armies, and although our own is as yet untried the future may be faced with confidence. The present is a period of probation; the future will determine the result. There can be but one result. Work and win.

P. A. F.

ANIMAL INDUSTRY AND WAR

About two-fifths of the farm products are represented by animals and their products. There is an intimate correlation. If cereals are in demand for human consumption and the prices high

more land is tilled and pasturage diminished. The high prices make it more profitable for the producer to sell his grain than to convert it into meat. On this and other accounts the decrease in animals, in the war ravaged countries, has been appalling. It is a question for careful consideration in this country.

The recent report of Secretary Houston shows that the United States Department of Agriculture has been alive to the situation. Forethought, efficiency and earnest endeavor have characterized the efforts to present the situation in its proper perspective. As a result there has been an increase along nearly all lines of production. Although some conditions have been unfavorable, there has been an aggregate increase, over 1916, of 1,006,000,000 bushels of cereals, from which a considerable amount must be retained for seed, and in which the percentage of soft corn was unusually high. Among the animals, the dairy and other cattle have shown an increase. Sheep, unfortunately, have continued to decline. Hogs, which during recent years have shown an upward tendency, decreased over 4,000,000, but in spite of this diminution, the total number is greater than it was at the beginning of the European war. The number of hogs varies from year to year more widely than that of the larger meat animals. The task of increasing the meat supply is necessarily slow and also difficult. Hogs and poultry yield the quickest returns and urgent efforts have been made to increase their production. Special campaigns have been conducted. Additional men have been employed to give their entire time to increasing the number of hogs, to encourage poultry raising and assist producers of beef cattle. In regions where there was a shortage of feed, cattle have been transferred to other areas where feed stuffs were relatively plentiful, and the lives of many were saved. In the West, the National Forest ranges were opened earlier than usual to prevent animal losses, especially of lambs and calves. The number grazed was increased by approximately 350,000 over any previous year. In spite of this the demand for grazing privileges could not be fully met. Plans for further utilization of the ranges for live stock production are being arranged for 1918.

In the control of animal diseases, special attention has been directed to the control of hog cholera and cattle ticks. Estimates show that the losses from hog cholera during the past fiscal year decreased by approximately 30 per cent and reached the lowest average per thousand head since 1894.

In the tick area, more than 40,000 square miles were released from quarantine during the past fiscal year and 1788 square miles on September 1, 1917. Sixty-five thousand five hundred and twenty square miles were placed in the tick-free area December 1. More than 51 per cent of the original infested territory has now been cleared of the tick. The work was greatly enlarged during the past summer, and many additional employees were assigned to it. The suppression of the tick makes possible the introduction of more and better beef and dairy cattle, and already thousands of fine breeding cattle have been procured by southern farmers.

Satisfactory progress has been made in the prevention or control of other destructive animal diseases. In 12 states an inspector has been detailed to assist in combating tuberculosis of cattle and swine and abortion of cattle. An extension of this work into 7 other states is contemplated. Men are regularly employed in the control of blackleg of cattle and anthrax of domestic animals.

The war calls for sacrifice and maximum effort. "The spirit revealed by the farmers and the results of their efforts indicate that they recognize the responsibility resting upon them in this emergency." "It is incumbent upon them, as it is upon all other civilians, to work and to save, to seek no mere selfish advantage, and to reveal the same spirit of devotion and willingness to make sacrifices and to give all they are and have which animate the soldier in the trenches, if this struggle is to be brought to a satisfactory conclusion." P. A. F.

EUROPEAN CHRONICLES

Bois Jerome.

CARTILAGINOUS QUITTOR AGAIN.—"*We will only say that we have operated on 700 cases, almost all exceedingly serious or complicated, and that our percentage of recovery has been 95% with an average treatment of between one or two months.*"

Such is the conclusion of the article on a NEW METHOD OF OPERATION that Veterinary Major Fleuret published in the *Recueil* of July 15th.

The method is said to have given remarkable results and consists in the resection of the coronary band and of the skin cover-

ing, thus exposing the cartilage and transforming the quittor into a flat wound easy to cicatrize.

The process is simple, quick and easy to perform. As I understand the technic, it is a slight circular thinning of the wall, around and below the coronary band, the whole extent of the swelling formed by the diseased cartilage, is the first step of the operation. In the second, an incision is made below the coronary with a double sage knife which is then pushed under the skin, and both band and cutaneous flaps are resected as one piece, exposing the cartilage which in the third step is removed in its complete entirety. A dressing with tincture of iodine, salol and boric acid and an ordinary antiseptic application represent the after treatment.

The progress of the cicatrization is said to be as follows: When the operation has been well performed, cicatrization goes on very regularly. The wound, in fifteen days, is covered with granulations. The swelling following the operation has disappeared. The wound is not painful to pressure and is limited to only two edges; the upper one cutaneous, thin, slowly spreading on the granulating surface; the lower one, much thicker, forming a band, grey whitish in color, slightly striated, and seems to be formed by a special developing continuation of the podophyllous tissue, assuming a very rapid *ascending* growth so as to soon reach the space primitively occupied by the resected coronary band. This new form leaves on its course, as it develops, a horny layer which mingles and unites to the wall without leaving any trace of the solution of continuity.

Notwithstanding the dangers, so much guarded against in relation to injuries to the coronary band, in the classical operation, and in which the coronary band was to be respected by all means; and also notwithstanding the objections that were made by some to the methods of Bayer or of Schroder in which the band is divided in two places in Bayer's and one with Schroder's operation, and again omitting the objections made to the Perrier process, where the excision of the flap of skin covering the cartilage is the principal step so as to expose the cartilage and permit its removal, a consideration of the new mode of operation is summarized by Mr. Fleuret as follows: "If it has been admitted that the coronary band was the only and true matrix of the wall, an organ which was to be touched only with the greatest respect, today we

are in a measure to affirm that its total ablation may be made without the slightest inconvenience. Its regeneration takes place rapidly and regularly without leaving any trace of solution of continuity and no deformity of the foot."

Seven hundred successful cases represent substantial proof.

Again on the same subject but without new treatment. The operation is old, easy, practical and without danger of complication and a prospect of recovery in three or four weeks. It was spoken of at the Societe Centrale by Major Haas, and consists in the thinning of the coronary band and wall with the introduction into the fistulous tracts of the quittor of a small seton, ribbon or cord impregnated with a blister ointment.

The technic is simple. The band and wall are pared thin as in ordinary cases, a probe is introduced into the fistula and pushed down on the podophyllous tissue where an incision is then made and the seton is introduced after complete curetting of the fistula. The incision of the podophyllous tissue must be made below the coronary band. The seton is changed after three days and renewed; it is left 10-15 days and the treatment is completed by injections of Villate solution. If there are two fistulas, two setons are required. Results: 160 treated. 95 cured and 65 improved.

Treatment of Wounds.—This is not the first time I have written on this subject, which has been and is so extensively treated in veterinary and human publications. It is but natural to think that the question is far from being exhausted. If the treatment of wounds has made progress; if the extensive and almost excessive use of antiseptics has proved to be injurious because of their inconvenience; the destruction of the microbes and also of the reproducing cells; if it has been necessary to obtain a dressing to preserve the vitality of the phagocytes and at the same time protect the wound from the danger of its environment and its floating germs; it can be readily understood how and why many human surgeons and veterinarians have tried to find the best method by which the principal and essential objects of a treatment may be realized.

Many of the methods offered have had their advocates: the dressing after cleaning the wounds with ether; the use of the nitrate of silver in solution; the application of oxygen; the applica-

tion of iodined ether; the treatment with saline water only; with a solution of chloride of lime, carbonate of soda and boric acid; with anhydrous chloride of magnesium; with continued irrigations of chloride of sodium; all have had their origin from human surgeons.

The magnificent records so often mentioned of the results obtained with the polyvalent serum of Leclainche and Vallée have also a claim in the progress made in the treatment of wounds.

Unfortunately the majority of these methods, so advantageous in human surgery, is not without great objection and in veterinary application and practice become exceedingly difficult and, in many instances, impossible to practice.

The objection is that they generally fail to offer the indispensable complement to the preparatory cleaning of a wound by giving it a solid protecting dressing against external microbes. A protection which could be obtained by an impermeable covering sufficiently adhesive to stick to the wound, cover it and carry in itself products able to destroy the microbes without danger to the vitality of the repairing cells.

This substance Major Bringard has worked to find, and he has made known the *new treatment* which he advocates for horses and all large animals.

The mixture that he proposes is made as follows: put in a basin one kilogram of coal tar, heat it over a slow fire, and mix with it 200 grams of chloride of lime and 100 of boric acid. Keep stirring with a spatula until a thorough incorporation is obtained.

This forms an impermeable mixture, which will adhere well to the wound, especially if, with wadding gently passed over the surface, all moisture has been removed.

Coal tar is absolutely necessary for preparing the mixture.

When the wound has been well cleaned from all foreign substances and dried with wadding passed over it, a layer of the plaster is easily and rapidly put on. If for any reason or other a little of the plaster has been removed, it can be covered anew without difficulty.

Under the application the cicatrization is said to go on rapidly and infected wounds are, after proper preparation, rapidly transformed; the vitality of the repairing cells is accelerated, the granulating processes rapidly develop and quick cicatrization follows.

To summarize, this method has for its advantages: 1st, a ra-

tional composition based on the most recent scientific discoveries. 2d, undoubted efficacy as proved by numerous experiments. 3d, it is surprisingly easy and rapid in application and requires no assistance. 4th, it is much cheaper than all other preparations. It deserves a trial.

TREATMENT OF RABIES.—A glance at the last table presenting the results of the anti-rabic vaccinations, performed at the Pasteur Institut in Paris and published since the foundation of the institution to the present, tells of the no longer disputed value of the great discovery made by the immortal Pasteur.

From 1886 to 1916, a period of 30 years, over thirty-five thousand persons have been treated and the mortality among them noted every year, has been slight; from 0.94 to 0.21, varying slightly and for some years remaining at zero.

Of course the figures are only the records of the Paris institution, where the treatment has been carried on, and of course submitted, as in other similar institutions, to the perfections that science could offer.

In relation to the subject, however, I find among the summaries of the *Presse Medicale* one which is very interesting.

It is that of a new Italian method for the treatment of rabies by Prof. Cl. Fermi, director of the Institut of Hygiene of the University of Sassari.

The professor has prepared a vaccine different from those ordinarily used in the treatment of hydrophobia.

The Fermi vaccine is an emulsion at 5% of a strong fixed and fresh rabbit or dog virus, phenolized at 1%. The spinal cord which is used in Pasteur's, and the Calmette methods and others is replaced in the Fermi method by the brain which he considers more active.

The anti-rabic serum is obtained by injecting into the horse the vaccine as an antigen and using the blood of the injected horse.

The serum-vaccine is a mixture of one part of serum and two of phenolized vaccine at 1%.

The new method consists in treating the patient with the serum-vaccine during the first five or ten days, continuing to the twenty-fifth with the vaccine.

The author claims that his vaccine is the most efficacious of all the vaccines used in the various Italian and French institutes.

The mortality in true failures (fifteen days after the end of the treatment) is of 0%. It is of 0.1% for false failures, those that occurred during the treatment or in the fifteen days that follow it.

Fermi's vaccine is entirely avirulent and its innocuousness is absolute.

The vaccine and the phenolized serum can be kept sterile and efficacious; the vaccine for six months, the serum for two. They can be transported to all countries, and every physician can have them at hand and use them without loss of time after the injury has been received. Numerous patients can thus be saved and much danger of infection avoided.

The Fermi vaccine is said to have been already used in English colonies since 1912.

BIBLIOGRAPHY—VETERINARY OBSTETRICS.—By W. L. Williams, Professor of Obstetrics and Research Professor in the Diseases of Breeding Cattle in the N. Y. State Veterinary College at Cornell University.

Some years ago it was my great pleasure to notice in my bibliographic reviews a work by Prof. Williams on Veterinary Obstetrics, including the diseases of breeding animals and of the new born.

That the book was bound to be a success could not be doubted and, in fact, the reception that it received at the hands of the profession was a full appreciation of its value. The first edition was, of course, looked upon as likely to be soon followed by a second edition; and yet the new *Veterinary Obstetrics* is not that second edition, with the ordinary notice of being corrected and considerably improved.

Professor Williams is not one to be satisfied with such a success as that obtained by his first publication. He is a deep thinker, he is one who will always try to improve what work he has undertaken or accomplished and with the large amount of research and investigation he has made, it was certain that he would be the one to undervalue the first attempt made in 1909. The result of his searching thoughts has been that the work before us is of an entirely different nature.

Originally, "Obstetrics" included the diseases of breeding animals and of the new born, all in one volume; but "the volume of 1909 has become so thoroughly obsolete in spirit and plan" that

Williams decided to prepare a new volume upon obstetrics and "a companion volume upon the genital organs, including those diseases of the young animals transmitted from mother to young *in utero* or through the milk."

Thus is opened a much wider field and a more thorough distribution and perfect connection of the subject, and the broad ground of all the related subjects will receive proper recognition.

This will be well because, as remarks Williams in his introduction, "Few branches of veterinary science are of more acute importance to the veterinarian than obstetrics, because generally the questions arising are pressing emergencies which brook no delay"; and again, as the professor points out, "Especially in the cases of dystocia or difficult parturition where a young man, not yet well up to practical work, may find himself embarrassed and may find if he fails in his attempts, in the presence of a layman, one who will do the work in which he did not succeed". This sad experience, the present writer encountered in the first years of his professional career.

Obstetrics is the most important work the country practitioners have to perform and the study of the subject, good as it may have been while at college, or promoted by the careful reading of books, practical experience must and will be of essential importance.

The first volume of Veterinary Obstetrics is a work of over 600 pages. It is illustrated with 140 figures, 3 of which are colored, and is published by the author.

A minute and critical analysis of its contents would demand the work of a specialist, if there is one in our ranks; but a concise examination will give a satisfactory explanation of the amount of good reading the book contains.

The anatomy and physiology relating to the organs of generation with an excellent article on embryology and teratology by Professor B. F. Kingsbury of the Medical College of Cornell University are followed by chapters on pregnancy or gestation; the hygiene of pregnant animals and physiological parturition; dystocia, maternal and fetal, with abnormalities in the development of or primary diseases of the fetus or its annexes. These are preceded by the chapter on wounds and injuries of the genital organs and finally puerperal infections and puerperal eclamptic diseases bring the contents of the book to its close. In the last section are

found references to the sow, sheep and bitch. The principal work relates to the large domestic animals, especially to cows.

The work is well presented. It has a methodical arrangement and distribution. It deals with each subject in its particular sphere. It is sufficiently illustrated for all necessary information and contains very good directions relative to the preparatory and necessary appliances for the special work which may be demanded. Veterinary Obstetrics is destined to be the classical work in America, it will certainly find its way in other countries, as it is now the most recent and modern work of our professional literature relative to the subject.

Professor Williams will do well not to keep us waiting too long for the second volume of his work.

Summary from Recent Publications Received and Bibliographic Notes.

Those marked "X" will be analyzed. Those marked "O" will appear in abstracts.

Veterinary Journal—(O) Interesting ovariotomy in a troublesome mare—Ulcerative cellulitis—(O) Presence of strongylus armatus in the testicle of a cryptorchid—(O) A peculiar case of temporary paralysis of the muscles of the neck in a horse—(O) An interesting patient—(O) A method of dealing with a punctured and suppurating eyeball—(O) Spasms of the diaphragm in a pony.

Veterinary Record—September. Treatment of eczema—(O) A record in temperature—Rats and swine fever—(O) Operation for radical cure of umbilical hernia—(O) Clinical cases.

Veterinary News—September—(O) A rare cystic condition. October—(O) Inversion of the bladder—(O) Coccidiosis in horses—(O) Tetanus after castration—(O) Eversion of the uterus in mares.

Il Nuovo Ercolani—Some notes on obstetrics. Uterine flexion and retroflexion. Some clinical characteristics of synovitis of the great sesamoid sheath in horses.

Annales de L'Institut Pasteur—Fecundation and phagocytosis—(X) Study on gaseous gangrene.

Revue Generale de Medecine Veter.—(X) Nicotine in mange—(X) Death of a veterinarian by rabies.

Bulletin Soc. Centrale—September—(X) Mixed mammary tumors in sluts (O) Treatment of epizootic and ulcerous lymphangitis by autopyotherapy.

Recueil de Medecine Veter.—(X) Typographic anatomy and place for the neurotomy of the median nerve—(X) Uremia of acarian origin in a horse.

Revue of Comparative Pathology—(X) Immutability of instincts in human races. Sulfurous gases in their various applications.

Bibliography—Veterinary Obstetrics. The animal industry of the south; past, present and future.

Department of Agriculture. Union of South Africa. Coccidiosis of the fowl.

Bureau of Animal Industry. Amendment of regulations governing meat inspection in the United States.

A. L.

VESICULAR STOMATITIS OF HORSES AND CATTLE*

JOHN R. MOHLER, Washington, D. C.

INTRODUCTION. Among the more important forms of stomatitis of particular interest to the members of this section may be mentioned mycotic stomatitis of cattle, which results from eating feed containing irritating fungi; necrotic stomatitis, especially affecting calves and pigs, which is caused by infection with the necrosis bacillus; stomatitis contagiosa, or foot-and-mouth disease, which is one of the most highly infectious diseases of animals and caused by a filterable virus; pustular stomatitis, which is less contagious in character than the former and confined solely to the equine; and vesicular stomatitis, concerning the character of which this paper will deal.

The name "vesicular stomatitis" not only indicates the location of the lesions in the mouth, but also suggests that the vesicles or blisters are characteristic features, being observed at the beginning of the disease. Other names which have been applied to this affection are sporadic aphthae, stomatitis vesiculosa, stomatitis aphthosa, erosive stomatitis, sore mouth, "blue tongue," and pseudo foot-and-mouth disease.

This affection is known in Europe and South Africa, and has been observed occasionally in sporadic form in the United States, but without attracting any particular attention. During the early fall of 1916, however, it became very extensive in certain sections of this country, being especially prevalent in Nebraska, South Dakota, Colorado, and Wyoming. It was first reported among the horses and mules at remount stations in the Central West, where large numbers of animals had been collected prior to shipment for use in the French and English armies. Here the disease found ideal conditions for its spread among thousands of these animals closely quartered in barns and pens. From these remount stations in the Central West the disease became distributed by following the channels of trade as far as the Atlantic Coast. The affection did not even stop there, as several shipments were made abroad while the horses were in the incubative stage of the disease, and infected American horses were found shortly after arrival in France.

*Presented at the 54th annual meeting of the American Veterinary Medical Association, Kansas City, Mo., August 1917.

Strange as it may seem, the first information that this country was experiencing an outbreak of vesicular stomatitis was reported in an article by the French veterinarian Joculet, which appeared in the *Recueil de Médicine Vétérinaire,* December 30, 1915. Owing to the difficulties attending the delivery of these European periodicals since the beginning of the war, this copy was not received until several months later. Jacoulet referred to the erosive stomatitis of indeterminate nature affecting horses coming from America for the French Army. He indicates that some of the veterinarians coming to the army depot were acquainted with this disease, calling it stomatitis of horses and attributing it to the fact that the new horses frequently licked the freshly whitewashed walls near them. The question of etiology was at once referred to the Pasteur Institute, but at that time attempts to carry the disease from horse to horse proved unsuccessful. The opinion was thereupon advanced that defective food probably of a mycotic nature was responsible, especially since moldiness was quite extensive in baled American hay brought over with the horses.

In the number of the above named French journal for February 29, 1916, Vigel records having observed the disease in question in a large number of American animals. On the basis of his observations he believes that the cause of vesicular stomatitis is a contagion and should not be looked for in the poor quality of hay, as the disease spread to French horses on the surrounding farms and these animals had never eaten American hay. At least one cow became similarly affected. Three bacteriologists of the French Army took samples of blood and vesicular fluid from infected horses, but their results were likewise negative. However, Vigel proved quite clearly that the disease is contagious and transmissible through direct inoculation. More recently, May 15, 1917, Panisset reports in the *Revue Générale de Medicine Veterinaire* that vesicular stomatitis had gained considerable ground during the previous few months, but not sufficient to cause any alarm. Particularly those depots that received horses coming from the first infected remount stations have paid heavy tribute to the affection. Although known and described before the present war, it had been observed only occasionally, and its present frequency in France is considered by Panisset to be due to importations of infected American horses for military purposes.

Notwithstanding that the disease primarily affects horses and

mules, it may spread to cattle under appropriate conditions, but thus far it has not been observed under natural conditions among hogs and sheep. Evidently the necessary conditions for its spread from horses to cattle obtained in Nebraska, as a shipment of cattle from that locality to the Kansas City Stock Yards last fall was found infected. Much excitement was occasioned thereby, as the disease was quite suggestive of foot-and-mouth disease. However, a series of careful experiments was at once begun, from which the true nature of the disease was ascertained and the diagnosis of vesicular stomatitis made.

ETIOLOGY. The literature upon the subject of vesicular stomatitis fails to incriminate definitely any specific organism as the cause of this contagion. Repeated cultural studies of fresh vesicular fluid drawn under aseptic precautions from experimentally infected horses and from field cases have resulted in the isolation of a variety of microorganisms, including micrococci, several short rod-shaped bacilli, one of which takes the bipolar stain, a large Gram-negative spore-bearing rod, and a fungus. Horses and calves were subjected to inoculations with cultures of these several organisms, both intravenously and by scarification of the epithelial covering of the tongue and inner surface of the lips, but in no instance was the inoculation successful. An inoculation test of a small micrococcus isolated and cultivated under strict anaerobic environment proved it to be innocuous to horses and calves. Finally, fresh vesicular fluid passed through a Berkefeld (N) filter was completely divested of all infectious qualities as determined by inoculation tests of the filtrate in six different experiments.

Microscopic examination of fresh vesicular fluid by dark-field illumination revealed the presence of micrococci and in addition small bodies with refractive coverings which were very similar in appearance to the spores of a fungus isolation on egg medium from a sample taken from a case of vesicular stomatitis.

A bacteriological report of the work done by Dr. George Mathers of the University of Chicago on the etiology of this disease was read by Dr. L. A. Merillat at the recent meeting of the United States Live Stock Sanitary Association (1), but the evidence presented in favor of the bacillus described was far from conclusive. Through the courtesy of Dr. James Gregg of the British Remount

1. Report of the twentieth annual meeting of the United States Live Stock Sanitary Association, December, 1916, page 33.

Station at Newport News, Va., several cultures of a microorganism which he had isolated from a case of vesicular stomatitis in a mule and with which suspicious symptoms of the disease were induced in other mules (2), were obtained for study. With this organism, which proved to be a facultative anaerobe and very slow to develop on any medium, we were unable to infect horses or calves by direct inoculation of large amounts of the culture. Moreover, the employment of this organism, as well as several other different organisms, as an antigen in the complement fixation test failed to give positive results with sera from either immune horses or immune cattle.

SYMPTOMS AND LESIONS. The first phenomenon of vesicular stomatitis consists in the formation of reddened patches on the buccal mucosa, especially of the tongue. These are quickly succeeded by vesicles or blisters of grayish-red color only slightly elevated and of various sizes from a dime to a silver dollar, filled with clear or yellowish serous fluid. These blisters may not be isolated, but frequently they coalesce to form a large vesicle. They usually rupture in a very short time, which accounts for their not being recognized at times even in the early stages of the disease. The rupture of the vesicles results in exposing the raw underlying surfaces, which appear as reddened erosions with the grayish-white fragments of the torn mucous membrane of the preexisting vesicle still attached to the irregular borders like a fringe. These erosions may become confluent, varying from the size of a dime to that of the palm of the hand, and may even involve practically the entire upper surface of the tongue in horses. Healing varies, but usually occurs quite rapidly in from 8 to 15 days in uncomplicated cases. While these lesions in horses are principally confined to the upper surface of the tongue, they may involve the inner surface of the lips, the angles of the mouth, and the gums. In cattle, on the other hand, the tongue does not appear to be so extensively affected, and lesions may also occur on the hard palate, lips, and gums, sometimes extending to the muzzle and around the nostrils. Often the lips of the horse are swollen and itchy, which causes the animal to rub the muzzle against any nearby object. In a very few cases fresh cows have shown similar lesions on the teats when their in-

2. *American Journal of Veterinary Medicine*, Vol. 2, No. 4, April, 1917, page 221.

fected calves had been sucking them, but no feet lesions have been observed in these cases.

Immediately before or simultaneously with the appearance of the vesicles there is present a moderate rise of temperature, which rapidly subsides. A more or less profuse flow of saliva follows, which dribbles from the lips and consists of a thin, stringy, or frothy fluid. Not infrequently the presence of salivation is the first indication that the animal is sick. Owing to the painful condition of the mouth at this stage, there is loss of appetite or at least inability to eat, and in horses gritting of the teeth is quite frequent, while in cattle "smacking" noises are heard as in foot-and-mouth disease. This sensitiveness as a rule remains for several days, after which healing commences, and it is remarkable to observe how quickly the sick animals will start to eat even while their tongues are still eroded. Although eating well, they do not regain their original thrifty appearance for some time longer. In dairy cows in addition to shrinkage in flesh, there is a noticeable reduction in the normal flow of milk for a few days.

So far as our observations are concerned, the period of incubation of vesicular stomatitis has varied from 36 hours to 9 days, but the greatest number of cases have occurred in from 2 to 5 days after exposure.

No losses have been reported from uncomplicated cases of this disease in either horses, mules, or cattle. A certain proportion of horses and mules having vesicular stomatitis also became infected with either influenza or contagious pneumonia, or perhaps both, and, of course, a number of deaths have occurred among such animals.

CONTAGIOUSNESS. That the malady is contagious has been definitely shown by the transmission of the disease from sick to healthy animals by inoculation. The degree of contagiousness, however, varies between wide limits. In fact, certain writers have claimed that it is not contagious, because they fail to reproduce the disease after experimenting with only one healthy animal. Our experience with this disease shows that frequently one or even more of the injected animals in an experiment will fail to develop the infection, as in several instances we have produced the disease in only two out of three, or two out of four, or again three out of nine of the experimental animals; so that it is necessary to use more than one animal if accurate information is to be obtained. This point is strongly brought out by the opposite conclusions reached

by the two French investigators, Jacoulet and Vigel, who recently found the disease in American horses shipped to France. The former believes the disease is benign, nontransmissible, and of alimentary origin, while the latter readily transmitted the disease to other horses and convinced himself of its contagiousness.

Experiments have proved that the disease is most virulent at the time the blisters rupture or shortly thereafter, but when the lesions are five or six days old the virus of the disease has practically disappeared. This may account for the greatly differing results investigators have had in their attempts to transfer the disease artificially. These facts show the necessity of using several experiment animals for inoculation, and also of injecting the infectious material as soon as possible after the blisters have formed.

The virus is evidently of short life, and is transmitted only by close contact. Probably the infected environment remains dangerous longer than the attacked animals. At the Bureau of Animal Industry Experiment Station one field was set aside for animals which had recovered from attacks of vesicular stomatitis. Horses and cattle were placed in this field three weeks after they first showed symptoms of the disease. Healthy susceptible cattle were kept in this field as a check on the possible spread of the disease, but in no instance did they become infected. Likewise, susceptible animals turned into a stable which three weeks previously in one instance, and sixteen days previously in another instance, had harbored active cases of vesicular stomatitis, remained well. Several instances have been reported in which a line fence or a board fence in a double corral has been sufficient to prevent the transmission of the disease from the infected animals on one side to the healthy animals on the other.

Investigations indicate that the disease is very seldom communicated by owners or caretakers of affected animals visiting other farms. As a rule the disease appears to spread by direct contact with recently affected animals, or by recently infected feed troughs, water troughs, bridles, or pails. Inoculation experiments on such laboratory animals as rabbits, guinea pigs, rats, and mice have resulted negatively. The disease manifests itself in susceptible animals more rapidly after the application of infectious material to scarified areas in the mouth than through intravenous injection, although positive results have been obtained also by the latter method.

Contrary to experiences in the field, we were able, in several test inoculations, to transmit infection to the feet of several cattle in a small porportion of cases, and likewise this virulent material also produced lesions in from five to nine days in the feet of one hog, in the mouth of another, and on the snout of the third. While these cases were the exception and not the rule, they should be recorded for their scientific interest. In this connection it should also be stated that a number of hogs in immediate contact with these animals but without receiving any artificial inoculation remained normal in all cases, while a number of cattle similarly exposed contracted lesions which were confined solely to the mouth. Infectious material expelled from the mouths of the attacked animals and kept moist by placing it in a sealed test tube protected against exposure to light, retained its virulence for three weeks in one instance. Such material after being dried or preserved in normal salt solution lost its virulence in a much shorter period of time.

Very little work appears to have been done on the question of immunity in this disease. A number of horses and cattle which were typically affected last fall at the Bureau Experiment Station failed to contract the disease when inoculated with the virus three months later, although the control animals became infected promptly. It may be stated that in these cases immunity had persisted for at least three months. Further tests regarding its duration could not be made, because the required infectious material was not obtainable owing to the disease having disappeared. Injections of blood serum from immune animals so far as tested induced no resistance to the disease.

Whether the milk of affected cattle is or is not infectious for people has not been recorded, but such milk has been fed experimentally to hogs, without producing any ill effects.

Differential Diagnosis. While the disease has not the great economical importance of foot-and-mouth disease, it nevertheless is contagious and causes considerable alarm owing to its close resemblance to the dreaded European disease. Furthermore, as most writers state, this infection in cattle may be readily confounded with foot-and-mouth disease, and experience has shown that a prompt and exact differentiation is accompanied by numerous difficulties. The real difficulties surrounding the diagnosis are best appreciated by those who have faced them with the consciousness that their pronouncement if mistaken would lead on one hand to

unnecessary and serious economic disturbances and on the other to the spread of one of the most dreaded and easily communicated among animal plagues. Vesicular stomatitis will therefore prove a menace whenever and wherever it may reappear. For these reasons it is strongly urged that local quarantines to prevent its spread be imposed by State live stock officials in whose territory the disease may be found. All owners and handlers of horses, mules, and cattle, particularly liverymen, managers of stock yards, and stockmen, should be directed to separate sick from well animals, clean and disinfect contaminated premises, and have all infected animals appropriately treated.

The opinion that the malady is not foot-and-mouth disease is based on the fact that persistent observation of sick animals has failed to reveal certain typical symptoms which would be expected in an outbreak of foot-and-mouth disease. The drooling, vesicles, and erosions are similar in appearance to those produced by foot-and-mouth disease, but in none of the animals examined in the field has there been found any soreness of the feet, which is a common symptom of foot-and-mouth disease. Moreover, many horses have this particular ailment, but horses have not been observed to contract foot-and-mouth disease in any of the previous foot-and-mouth outbreaks in the United States. Hundreds of hogs exposed to the disease and in association with the sick animals in pastures have shown no signs of the malady, and this is regarded as significant, because in the last outbreak of foot-and-mouth disease hogs were as susceptible to that disease as were cattle. Exposed sheep also fail to show vesicular stomatitis, yet these cloven-footed animals are susceptible to foot-and-mouth infection. In a number of cases of vesicular stomatitis the lesions appeared to me continuous or progressive, and not explosive as in foot-and-mouth disease. In these instances secondary lesions were apparent on a number of consecutive days in the mouths of both horses and cattle, and vesicles were observed on the base of tongues whose free portions were almost denuded of mucous membrane as a result of the rupture of similar vesicles six or seven days before.

Complications are extremely rare in vesicular stomatitis, and neither chronic diseases of the hoof nor mammitis have been observed following it. Sucking calves are seldom affected with the disease, and rarely in other than a mild form, while an attack of foot-and-mouth disease in calves is always serious and not infre-

quently fatal. The vesicles in foot-and-mouth disease as a rule are larger than in vesicular stomatitis, and are more tightly filled with serous fluid. Furthermore, instead of increasing in virulence by passage through a series of calves, as foot-and-mouth disease has always done in our previous experiments, vesicular stomatitis became greatly reduced in pathogenesis and required a constantly increasing period of incubation before manifesting lesions of the disease. Although numerous filtrate experiments have been conducted, in no case has the disease been produced in this manner, which is also unlike our experiments with foot-and-mouth disease.

The percentage of animals infected in each of the herds of cattle, and the history of exposure without transmission of the disease except by immediate contact, would indicate that this ailment is not the highly contagious foot-and-mouth disease which, once it is introduced into a herd, quickly affects practically 100 per cent of the cattle and hogs on all the farms to which the virus may be carried by intermediate agencies.

The result of this study of vesicular stomatitis suggests the necessity of inoculating horses with suspected material in any future outbreak of disease bearing a resemblance to foot-and-mouth disease.

Finally, it must be apparent that in vesicular stomatitis we have a disease more closely resembling foot-and-mouth disease than either mycotic or necrotic stomatitis, and that Hutyra and Marek are correct in their opinion that a reliable differential diagnosis can be made only after inoculation experiments and careful observation lasting a number of days.

In mycotic stomatitis portions of the lining membrane of the mouth become inflamed, and in a few days it changes to a croupous membrane which peels off leaving a raw surface, while the thin skin between the toes may also be inflamed. Swelling of the feet and stiffness of the animal are frequently apparent in mycotic stomatitis. The previous history of the case, the absence of its spread to horses exposed to the infection, and the complete negative results obtained by the inoculation of calves, distinguish between the local disease named and vesicular stomatitis. Mycotic stomatitis occurs in only from 10 to 50 per cent of the cattle in a herd, usually in the late summer or early fall after a dry spell, and it does not run a regular course.

Necrotic stomatitis may be distinguished from vesicular stoma-

titis by the fact that while it affects cattle and especially calves, it may also involve pigs and sheep, but its spread among the animals of a herd shows a much lower degree of infectiousness than vesicular stomatitis. The characteristic lesion of the latter is the appearance of blisters containing a serous fluid on the mucous membrane of the mouth of the affected animals. In necrotic stomatitis blisters are never formed, destruction of the tissues occurring from the beginning and being followed by the formation of yellowish cheesy patches principally found involving the lining membrane of the mouth, especially the tongue and cheeks. The cause is the *Bacillus necrophorus.*

In horses vesicular stomatitis must be differentiated from contagious pustular stomatitis, which is not difficult. In the latter disease there are no simple erosions, but instead there are raised nodules on the mucous membrane of the mouth. These nodules suppurate and liquefy in their center, causing the conical surfaces to slough, resulting in the formation of pustules or ulcers, from which the name of the disease is derived. The location of the nodules and pustules is chiefly on the lips, gums, inside of the cheek, and on the tips and sides of the tongue. While the disease may be artificially transmitted to cattle, sheep, and hogs, it occurs under natural conditions only among equines.

Treatment. The treatment of vesicular stomatitis consists in first removing the affected from the healthy animals and isolating the former until fully recovered. Such isolation together with the adoption of rigid sanitary precautions greatly reduces the prevalence of the disease. If the animals are gentle enough to be handled, one-half tablespoonful of borax should be placed on the tongue twice daily, or the mouth syringed several times a day with a 1% solution of permanganate of potassium; otherwise 2 heaping tablespoonfuls of borax or 1 tablespoonful of potassium chlorate should be dissolved in a bucket of water and the affected animals should be allowed to drink or rinse their mouths with this medicated water at their pleasure. Hay should not be fed the first few days, but instead give bran and soft feed. If the animals are treated in this manner and carefully fed, the disease should rapidly disappear.

Discussion

Dr. Lamb: In the discussion of any subject it is presumed that the one discussing it has some special knowledge of it. Of

course, I have no special knowledge on this subject. We have heard it presented in a very masterful way, and the paper seems to include about all that any of us know.

My state has been blessed, or otherwise, with several outbreaks of this disease. I am expected to recount some of my experiences in the field with this particular disease.

Vesicular stomatitis made its first appearance in Colorado, in a shipment of horses from Omaha, Neb., arriving in Denver August 24th, 1916. The affected animals were isolated and treated, the stables disinfected and very few horses contracted the disease.

On Sept. 23rd, 1916, in company with Dr. W. E. Howe, Government Inspector in charge, in Colorado, together with two of his inspectors, one of whom had experience with foot and mouth disease in various eastern states during the outbreak of 1914, I visited the western portion of the San Luis Valley about 300 miles from Denver. At one ranch we found one cow affected and apparently the only one affected, though running in the same field with about 15 head. This case seemed to assume the necrotic form. On another farm, several miles away, a man had two horses affected and the disease had been present in his place for several weeks as he had lost two horses probably from starvation, due to inability to eat on account of the condition of the mouth. Several swine on this place were observed and none of them showed any evidence of disease.

On another ranch several cows suckling calves, were badly affected in the teats, which were covered with a thick, hard, black scab. At another farm a considerable number of calves were affected with typical symptoms of foot and mouth disease as regards the mouth symptoms; smacking of the lips, dribbling of saliva, but in no instance were there any foot lesions. On this place there were several horses with large raw surfaces on the tongue.

We visited a logging camp up in the hills and found practically every horse in the stable affected. In no instance did I find vesicles, the mucous membrane of the tongue appeared as though parboiled and upon slight pressure peeled off quite like peeling a banana. In none of these cases could any connection be traced to the disease among the horses in the Denver yards. The ranches were widely separated and all were a long distance from the logging camp where the horses were stabled and not turned on pasture, hence no means of the infection being transmitted from one herd to another could be traced; besides the animals on the different places seemed to be affected at about the same time.

On October 12th the disease again made its appearance among the horses offered for inspection for war purposes at the Denver yards, in a shipment made by George King from Grand Island, Nebraska. This outbreak spread to a much larger number of

horses than the previous one in spite of segregation, disinfection and treatment, and during the next few months it became quite prevalent in various portions of the state, being disseminated mostly by horses through the medium of feed barns in town, and in several instances by horses ridden or driven to school by children. One affected horse in this way scattered the disease to an entire school district. There are comparatively few instances of the disease being spread by cattle, practically every outbreak being traceable to horses, though in some instances it was impossible to definitely determine the source of infection. The disease ran a course of from one to three weeks, varying with the severity of the case. No treatment was attempted with any animals except broken horses, this treatment consisting in washing the mouth with a mild antiseptic solution of permanganate of potash. A strength of about 1 to 100 was probably the most successful.

There was very little death loss from this disease and what loss did occur was in old and badly debilitated animals, probably from starvation due to inability to eat. The chief loss was from loss of flesh during the progress of the disease.

The rapidity of recovery was certainly remarkable when one considers the severity of the symptoms and the extent of the lesions. A few cases developed the necrotic form and were much more resistant to treatment. The only animals contracting the disease were horses and cattle and, of these, horses seemed to be the most susceptible, and to be the most severely affected. In numerous instances swine were exposed but not affected. The greatest economic importance of this disease is, that the symptoms are very similar, in fact, almost identical with those of foot and mouth disease, and for this reason there is great danger of confounding one with the other; one point of difference being that in no instance, in my experience, has there been any foot lesions. The distinguishing difference seems to be the class of animals affected. Foot and mouth disease is said to attack all cloven footed animals and no others, while vesicular stomatitis affects the horse with much severity and does not affect swine, though they are especially susceptible to foot and mouth disease. What the man in the field needs, and hopes soon to be provided with, is a method of differentiating these diseases without the delay of inoculations or the subjection of various animals to exposure.

DR. FRENCH: From what we all know or learn of vesicular stomatitis, it runs about the same course in all communities. I think Wyoming had its share of vesicular stomatitis the past winter. The first occurrence of it was some thirty days after they found it in Kansas City. If the genuine foot-and-mouth disease should ever get into a state like Wyoming, I feel there would be more trouble in controlling it than there was in all the twenty-two states where it appeared. We have 50,000 elk in the state of Wy-

oming, and if they are susceptible to it, I do not know what we could do except to get a gun and go hunting. In one county there was a round-up, and there were about 40 riders at this man's property riding for cattle. Almost every one of those riders carried the infection home with their horses, so we had practically a whole county infected to start with. We commenced placing quarantines, and at first attempted to isolate the infected animals from the well ones and treat them, but in our state the herds run anywhere from a few hundred to a few thousand, and they are practically all wild animals, and I quickly learned that we had more than our hands full with trying to treat these animals. I quit ordering them to be isolated. Inside of a week the greater percentage of the infected animals had apparently recovered, and I do not believe it is the best policy to undertake to treat a herd of anywhere from three or four hundred to five thousand range cattle. One always finds them on the fight when he tries to do it, and our loss did not amount to anything at all from vesicular stomatitis. It had this effect that when later on we had a very hard winter, the after-effects of vesicular stomatitis, I am sure, caused us considerable loss from the weakened condition of the animals during the blizzards. Horses seemed to be affected a great deal more severely than cattle. In some cases I visited places the second time as long as ten weeks after the infection, and I found that the lesions were not all healed. In several bunches of cattle I found calves affected, and the disease killed some of the calves. As for taking them off hay and putting them on bran, I do not believe one of those range animals can be taught to eat bran. It would get well before it learned to eat bran. We quarantined horses and cattle both, and we did not allow a rider off that range, and we tried not to allow neighbors to bring horses to the place. In the dairy cow districts we attempted to treat these animals, and I believe it shortened the course of the disease. The disease swooped down on us before we knew what we were about, and it gradually disappeared and we were through with it. The longer the disease ran in our country the less virulent it was, and so far as the direct loss from the disease was concerned, I do not consider we had any. There is one question I should like to ask Dr. Mohler and that is, if an animal has had the disease is it liable to contract it again?

DR. MOHLER: Replying to Dr. French's query, I have already referred to the fact that we conducted only a few experiments to determine the period of immunity resulting from a previous attack of this disease. In these experiments, which were properly controlled, immunity was found to persist for at least three months in the animals tested. Unfortunately it was impossible to ascertain whether the immunity was of still longer duration since by that time the virus had exhausted itself both in the field and at our experiment station, thus preventing further exposure of previously affected animals.

INFLUENZA WITH SPECIAL REFERENCE TO SOME IMPORTANT COMPLICATIONS*

G. W. DUNPHY, East Lansing, Mich.

I believe I am about to call your attention to one of the great economic problems that is confronting the veterinary profession on this continent today. Equine influenza, pink eye, catarrhal fever, or shipping fever, as it is termed, is one of the most important diseases that we are confronted with in the practice of veterinary medicine, owing to the fact that all shipping points, as well as stables and other places where horses are assembled in considerable numbers, seem to be infected; and while the mortality is not high in proportion to the number affected, the economic loss is very large, as the animals are run down in condition, weakened and debilitated to such an extent that they are unfit for use for several weeks; and if succeeded by some of the frequent complications that follow, they may be incapacitated for months. I believe this economic point has never been fully emphasized.

The term influenza is generally applied to several forms of the infectious disease that prevails so generally among horses in the stock yards and other places where horses are assembled, whether the disease is confined to the respiratory organs alone or involves other organs of the body.

Various European authorities have endeavored to differentiate between the catarrhal and pectoral forms of the disease, but owing to the fact that the period of incubation, the infectious nature of the malady, and its occurrence in the same stable, in the same shipment of horses, and under the same conditions, we are warranted in assuming the position that these are only different aspects of the one disease. However, my object is not so much to invite discussion of this particular phase of the disease as it is to get the ideas of those who have had a wide experience in its treatment or control, so that we may be able to devise the best means to do our bit for the country in aiding the War Department in handling the large number of horses that will be assembled together in our remount stations and other places where it will be necessary to gather together horses and mules for artillery, cavalry, and supply trains.

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Equine influenza may be defined to be a contagious, febrile disease, either of an acute or sub-acute character, accompanied with dullness, high fever, cough, in the majority of cases, and sore throat; swelling of the limbs and torpidity of the liver, showing itself by the appearance of jaundice, indicated by the yellow tinge of the conjunctiva and visible mucous membranes. The highly contagious nature of influenza makes it extremely hard to contend with. It is the dread of the horse dealer, and the great scourge of the horse market. Convalescent animals seem to be distributors of the disease to some extent, as well as those in the acute stages, and even recovered animals may be spreaders of the infection.

A case is recorded by Dr. A. McKercher of Lansing, in which a stallion conveyed the disease to the mares he served for a period of 12 months after his recovery. However, this is an exceptional case, but shows plainly that the causative factor that produces the disease may remain in the blood or glandular secretions for a considerable length of time.

As a rule, animals that have recovered from the disease are immune for a long period. In fact, we may have good reason to consider them as permanently immune. However, some European authorities claim that horses that have recovered from the catarrhal form of influenza may develop the pectoral form, and vice versa those that have recovered from pleuro-pneumonia may be affected with the catarrhal form.

I believe this to be a doubtful conclusion, but as all rules have exceptions, this may be simply an exception to the general rule; but we can readily understand that cases of sporadic pneumonia may occur in animals that can easily be mistaken for the infectious form characteristic of influenza. A considerable amount of bacterial investigation and experimentation so far has not definitely settled the cause of the disease. This experimentation has been carried on by a careful study of the bacteria present in these outbreaks, and also by artificial inoculations; and now, I believe the generally accepted theory in Europe, quoting from Hutyra and Marek, is that equine influenza is caused by a filterable virus. However, this is usually the last resort of the tired bacteriologist, and research man, when other efforts have failed to isolate a microorganism upon which the responsibility can be placed. If we accept the theory of Hutyra and Marek, we are led to believe that this filterable virus is present in the blood, and no doubt in other fluids of the body.

A number of experiments made in this country by Dr. Ferry that came indirectly under my observation seem to demonstrate the fact that a certain streptococcus, presumably the organism described by Schutz and others, might be responsible for the disease, as out of 63 cases of horses in different stages of influenza, this organism was found in the blood of 34. Inoculation experiments in connection with this work, while not carried on to any great extent, showed that this organism will produce fever, prostration, cough, and discharge from the nostrils, which are very characteristic of influenza. This not being the essential feature of this paper, I will pass it over for the present, as our time is limited.

The period of incubation might be said to be from three to six days, but in exceptional cases it has been known to run as late as 14 or 15 days. It is usually ushered in with rigor or chill, followed by a rapid rise of temperature, 104 to 106° F.; and an increased pulse beat, followed by dullness, lassitude, and diminished appetite. The affected animal usually remains standing, showing no desire to lie down, unless abdominal complications set in.

A very prominent symptom in the majority of cases is a red and inflamed condition of the conjunctiva and swelling of the eyelids. These dropsical manifestations extend to the abdomen and limbs. Respiration is accelerated, and the cough, at first dry and painful, gradually becomes moist and is followed by a muco-purulent discharge from the nostrils. In the early stages, we usually have constipation, followed, in some cases, by a fetid diarrhea. Urine, in all cases, is scanty and highly colored, containing large quantities of albumen and bile pigments.

A great many peculiar phenomena present themselves in an outbreak of equine influenza. In some cases, we find well-marked symptoms of laminitis, while in others we have evidence of articular rheumatism; again, we find a semi-paralysis with incoordination of the limbs, showing the depressing influence of the toxin on the motor nerves.

I feel that it would be useless and unwarranted to dwell on the symptoms and appearance of this disease, as it is familiar to all practitioners, but will call attention to some of the serious complications that often follow in its wake.

Perhaps, the most serious of these complications is pneumonia, which, owing to the debilitated condition of the animal and the very feeble resistance offered, usually terminates fatally. Another seri-

ous sequel of equine influenza is purpura hemorrhagica. While not as fatal as pneumonia, it is always very tedious and inflicts considerable loss in time and depletion of the animal's condition. Roaring is another sequel of this disease, which reduces the price of the animal at least 50%, although this condition can be relieved by careful surgery.

With this immense economic loss staring us in the face, is it not time for the veterinary profession to make a special effort to stamp out this serious menace to the horse industry of the country? If this is as important an economic matter as I maintain that it is under ordinary conditions, it must be infinitely greater now that we are engaged in the greatest war the world has ever known, and thousands of horses will be needed for the various departments of our army. These horses and mules will be gathered in large numbers in our remount stations, and other places where it will be necessary to assemble them for use when needed, where proper care is almost out of the question. We can imagine the immense inconvenience and loss to our government with from 20 to 80% of these animals suffering from influenza in its various forms. Battles have been lost and wars have been decided by armies not being able to strike at the critical time, and who knows but that this same condition may arise in the present gigantic struggle; then, is it not the duty of our profession to take this matter in hand and urge upon our government the necessity of cleaning up these shipping yards, stables, and cars. The stock yards companies can be induced to do this, which was plainly evidenced in the case of the outbreak of foot-and-mouth disease in Chicago in 1914.

I am well satisfied if this proposition were carried out it would be the saving of millions of dollars to shippers and owners annually. There are two methods of prevention that can be used in controlling influenza: first, practical disinfection and fumigation of stables, stock yards, and railroad cars; second, prophylactic vaccination before shipment, and, if possible, before exposure.

In regard to the first proposition, it may look like a very large undertaking, but it is not an impossibility, and I believe that the time will surely come when it will be demanded. Why not do it now? The time is ripe. I think we could have the War Department back of us. Shall we try?

The second proposition is easy to put into effect. It is generally admitted that an animal, after recovering from influenza,

is immune to another attack for a long period. Therefore, for protective purposes in animals which have never suffered with this disease, we must attempt to produce the same conditions by artificial means. This can be accomplished in several ways: either by injecting into the blood of the animal living virulent bacteria, by injecting bacterial products arising from the disintegration of the cells after death, by injecting dead bacteria, or by injecting bacterial products arising from the disintegration of the cells after death, by injecting dead bacteria, or by injecting bacterial products secreted or excreted during the life of the bacteria. For practical purposes, I believe the safest procedure in the majority of cases is to use suspensions of dead bacteria, which are termed bacterins.

Dr. Ferry's experiments demonstrated clearly that a certain streptococcus exists in the majority of cases of influenza. Would it not be wise to use vaccines prepared from these organisms? Whether these are really the primary cause of the disease is not the issue at present. Experiments have shown that horses can be immuned in this way, and further animal experiments have shown that prophylactic injections of suspensions of these dead organisms will protect against injections of the living virulent bacteria; and tests of the blood of the protected animal, according to the opsonic index, have shown a large increase in the opsonins. I would urge the vaccination of all horses before being shipped, and in order to protect horses already in the stables, they should be given a thorough course of prophylactic treatment.

While carrying out this prophylactic treatment alone would not be striking at the root of the evil, as it would be almost too much to expect the vaccination would protect, in all cases, horses that are shipped into those contaminated yards and stables that are fairly reeking with infection. Let us, then, urge upon those who have authority the thorough cleansing and disinfecting of all cars, yards, and stables where horses are handled, and especially where the horses that are purchased by our War Department have to be assembled. It is a duty, as members of the profession, that we owe to the horse interests of the country; it is a duty that we owe to the War Department; it is a patriotic duty that we owe to our country in this important period in our history; it is, also, a duty that we owe to humanity to do our part in endeavoring to aid the cause of democracy until the outrageous cruelties of Kaiserism are banished from the earth.

THE VALUE AND IMPORTANCE OF VETERINARY SERVICE IN THE INTEREST AND WELFARE OF THE PUBLIC HEALTH*

WILLIAM THOMSON, Keremeos, B. C.

The value and importance of properly qualified veterinary service in the preservation of the health not only of the lower animals, but of human beings has seldom received such just and universal recognition as today; but the necessity for competent veterinary authority with the steadily increasing demand for competent private practitioners has long ago been admitted by the leading thinkers of our land. Ever since the inception of the first veterinary college (1762, at Lyon, France), when ignorant prejudice previously held sway, it has been a long, arduous, uphill task. With the corner stones laid upon the principles and knowledge gained in the practice and study of human medicine, a public service has been built up, which has come to be recognized as only second in importance to that of the medical, equally responsible and indispensable for the preservation of the health of human beings. If it is admissible, I would say that the competent, properly licensed veterinary surgeon is indirectly responsible for the preservation of the public health. The population of the animal kingdom greatly exceeds that of the human kingdom and the universal tendency is to produce better animals, thereby creating a better and more wholesome demand, with better remuneration for competent veterinary service. We must admit with sadness that, if this terrible war which the German nation has thrust upon an innocent, unwilling world continues, the best of human virility will be destroyed, necessitating the adoption of a universal policy for the more rigid conservation of the public health. Never more true than today is the phrase that the "boy is father to the man." The birth rate in Germany in 1915 decreased by 20 per cent, and in 1916 by 40 per cent. This is the natural result of a war of such magnitude and all nations that contribute to the fighting forces will suffer more or less in proportion. Legislation for the better conservation of child life is becoming manifestly more urgent, in the ratio of our casualties on the European battle fields,

*Presented at the meeting of the British Columbia Veterinary Association, Penticton, B. C., September, 1917.

where our brave Canadian lads are struggling heroically for an early decisive victory; a victory which will bring from the enemies of free democratic peoples a sufficient guarantee of security; which should bring a peace everlasting. The policy for the conservation of human life, especially our child life, is a problem which will command the attention of our leading men more and more. The service or equipment of any organization, institution, or legally appointed board for the preservation of public health cannot possibly be adequate to the tasks involved, without the advice and assistance of competent veterinary scientists. If it would be criminal to remove from the public service all the veterinarians employed, it is equally criminal for local authorities to ignore competent veterinary advice and assistance.

The veterinary profession has a two-fold mission to perform; the first, and indirect part, is to prevent human beings from becoming infected with loathsome and fatal diseases, easily transmissible to them from the lower creation. The second, or direct part, is to heal dumb animals.

Some may be inclined toward criticism and demand some tangible proof of the importance of the veterinarian as bearing on the preservation of the public health. In reply I might point out that he is the only local authority who is properly qualified to detect the terrible disease of rabies in the lower animals, thereby promptly obtaining an isolation of the infected. There are many more terrible diseases that the veterinarian's special education and skill fit him to detect and control. As an example, take anthrax; the tendency in a man affected with anthrax is to commit suicide. The number of human beings suffering and dying from tuberculosis equals the casualties of many wars. Every mother should know that if her children are fed on milk from a tubercular cow, when the germs of the disease are passing with the milk, they will develop tuberculosis. I once saw a case of acute glanders in a man who did not survive many days. He was the keeper of a livery stable in Linlithgowshire in Scotland. After a night's debauch he drank liberally from the horse trough in the morning. I am of the opinion that many people died in Europe and the British Isles of glanders, which had been diagnosed as bronchitis. It is my opinion that many people every year die in America from diseases of animal origin. Wherever qualified veterinarians have received proper recognition from the authorities, and adequate

remuneration for their services, they have never failed to stamp out outbreaks of disease. In 1882 when Dr. Koch of Germany discovered and isolated the actual causative agent of consumption there was for a long time a controversy to the effect that the bacillus of the disease could not be transmitted from cattle to man. It was a veterinary surgeon who first proved that cattle were infecting human beings frequently. It is true that glanders continues to break out in isolated places and sometimes in community centers, but the veterinarian is on its trail and soon has it under control. Can the same be said of tuberculosis? Given proper support tuberculosis in cattle could be eradicated, but the country must be prepared to pay the price. There are many other diseases of animal origin filling human graves by the millions, allowed to go unchecked, for the want of skilled veterinary assistance.

A community goes a long way today in seeing to it that it is protected from the dread results of animal contagion, by insisting that local authorities secure the services of trained veterinarians. The United States of America employes about one thousand veterinarians in the meat inspection service, and control of contagious diseases transmissible to man. It is up to every person to fight a state wide battle for pure milk, pure meat, and pure food of every kind. The blood of the poor man is worth as much to the State as that of the rich man, in fact more, as he generally raises the larger family. No means should be left untried, no essential service or veterinary advice ignored, that will advance our knowledge or system of safeguarding the public health, and especially the health of our children.

Very often milk is sold to the public, especially in unorganized communities, which contains not only the bacillus of tuberculosis, but pus germs as well. Milch cows frequently suffer from diseases of the udder; fistula, for instance, when suppuration is present, with pus passing freely into the milk. Many fistulous udders have come under my notice, and in dairies where all the milk is mixed, milk from one cow will contaminate the entire supply. Pus germs must frequently, under such circumstances, gain access to mankind, and is, in my opinion, the source of many differently situated abscesses. We hear of abscess in the spinal articulations, the kidneys, the mesentery, appendix, and in the brain. Diphtheria and other diseases of children can frequently be traced to the milk

route. If all milch cows were constantly under official supervision, and commercial milk pasteurized at communal plants, especially in unorganized districts, cases of disease in children and weaker individuals would be reduced to a minimum. With every conquest over nature, veterinary science continues to grow, and like all other progressive sciences, it has to be studied in the laboratory and in the field. If there is any graduate who, fifteen or twenty years ago, emerged from the portals of his alma mater with his diploma under his arm, thought he had learned it all, and failed to keep abreast of the times, he must be living on personality instead of merit.

People today are taking a livelier and more widespread interest in the factors which make for health, since the world began. In most cases the saying that "the ills that flesh is heir to" is a libel on God. Advanced veterinary medical science impeaches this old phrase, and tells us that we are *not* heirs to any disease, or physical ills; the most of them and the suffering and woe, is inflicted by flagrant transgressions of hygienic laws. It is generally conceded by the advanced thinkers of today that most people know more about the old testament and spiritual religion than hygienic laws and physical truths. I have the greatest admiration for those eminent and courageous divines, who, all over this continent, are constantly fighting for the higher ideal, a purer character and sanctity of soul, but it is along spiritual lines, and my subject is of the physical law. While I am not prepared to controvert the claim that the spiritual law possesses a dominant power over the physical law, my observations in widely different countries impress me with physical truths that open up vast fields for research and invite a physical culture and religion, the application of which in time would produce a physical perfection which would leave no room for a pimple on the body or a stain on the soul. In the physical sphere, as in the spiritual sphere, we must fight constantly and consistently for our ideal. The relation and importance of the properly qualified veterinarian to the public health cannot be overestimated.

Thanks are due to the eminent bacteriologists, medical and veterinary, who have given to the world a knowledge of the mystery of the bacterial medium of the destroying force or law, which Hindu mythology has in seeming ignorance enshrined. In the Hindu trinity there are three gods in one, representing the three

great forces of the almighty law on earth: Brahma the creator, Vishnu the preserver, and Siva the destroyer. Siva is ever ready to enforce the law of destruction by disintegration and dissolution in all cases where Vishnu fails to exercise the law of preservation. As most people worship more or less at the temple of physical destruction, it becomes the duty of the trustees of the public health to enforce the law of preservation.

Rural meat inspection in this country is now conspicuous by its absence. It is most astonishing to find the amount of apathy and indifference with which people living in rural districts look upon this subject, when they look upon it at all. With the teaching of hygiene in our schools and colleges, most people take credit for being enlightened and presume their mode of living far superior to that of people of other countries. It is my deliberate intention to disillusion this class and to the intelligent class of the rural population I make my plea for legislative action in order to safeguard the public health against infection from the lower animals, which, when not contributing to the prosperity of the undertaker class, lowers the standard of the national physical health. I do not wish, however, to pose as an alarmist, and the facts hereafter set forth are not presented to create a sensational story; they are merely the observations of one who has travelled widely and who has with unprejudiced mind been accustomed to examine the manners and customs of different peoples in different parts of the globe. Meat and milk inspection, for instance, in the enlightened countries of Europe is more efficient and systematic than any on this continent. While I have nothing to say in favor of German culture, rural meat and milk sale and consumption are absolutely under control of local authorities acting under instructions from State Boards of Health to such an extent that a farmer may *not* kill an animal for his own consumption without inspection, and for which a small fee is charged. I also take the stand from a sanitary point that *no* man should be allowed to kill one of his own animals, far less any one's else, and feed the meat to the inmates of his household without inspection, for if we are going to have any inspection it must leave no leak or loophole. Perfunctory methods are worse than useless. Certain municipalities possess abattoirs and have adopted compulsory inspection of meat and milk under the advice and guidance of federal and provincial authorities; but it extends *no* benefit to the people

living outside those incorporated communities. The plain facts are that while municipalities can, and some do, avail themselves of facilities provided by legislation to protect the communities against diseased meat and milk and even fish, the rural population possesses no facilities for protection against the perpetual menace. The danger has never been popularly estimated and in my humble opinion the danger to the rural population of a country like Canada cannot be overestimated. If my small voice could reach the delicate minded, the pure souled, the susceptible men and women, and above all, our greatest asset, the educated boys and girls of western Canada, what I have seen in this connection; aye those who boast of their fresh air mode, their wide acred freedom, and their advanced civilization which boasts of only an intermittent sick bed; consternation and righteous indignation would at once possess them and wake up the most unconcerned to a situation repulsive, abhorrent and dangerous; a situation to which the vending section has become accustomed in the absence of legislation, and which continues to exact its toll of human beings in an insidious manner.

This is not only an interpretation of the situation, I am sure it is the opinion of my colleagues of the veterinary and medical professions of this country who have the intelligence to estimate the facts, and the courage to face them.

The efforts of investigators to get at the real facts surrounding suspicious hog pens are frequently thwarted by secrecy and reticence. In many cases where cholera exists, before anyone outside the ownership is aware of it, the hogs are slaughtered and sold for human consumption, thus lowering the health and power of resistance of consumers, exposing them to functional organic disorders, and spreading hog cholera to other herds.

Four years ago I was called by a gentleman reputed to be very religious to make a diagnosis of a sick horse. On arrival I found the horse dead behind the barn; evidently he had been dead an hour. I did not know what the animal died of, and I was not asked to make a postmortem examination; under such circumstances I always deem it advisable, in the absence of a fertilizer plant in the vicinity, to have such carcasses either cremated or buried deep in quick lime. This gentleman adopted one of the most common methods of disposal of animals dying from disease in this country: he gave his hogs access to it with all the composure

of a religious mind, quite indifferent as to possible disastrous physical results. I noted that most of the hogs were ready for the butcher, for they were fat. Two days later I observed several dressed hog carcasses at the railway depot, consigned from this gentleman to a well known butcher in a neighboring town. Two days later I had occasion to go to that town and needless to add, the very mention of pork on the menu card of my hotel forced me to adopt a vegetarian diet during my stay.

The lack of system by which pigs are allowed to run at large, having access to garbage and offal, is in my opinion tantamount to spreading the white plague and other diseases, including tapeworm and trichinosis. Sanitariums for the treatment of consumption are to found all over the land and more are springing up sporadically to meet the demand; while the main roots of spreading the disease are allowed free and uninterrupted growth.

The sanitary condition of the majority of our rural slaughter houses is a standing disgrace to our boasted civilization. I have known animals to be run almost to death on hot days getting them to the slaughter and immediately slaughtered, and because of the consequent waste products of increased metabolism the keeping and nutritive value of the meat was more or less counteracted by the amount of effete material accumulated in the tissues.

These slaughter houses are barbaric nuisances and are usually located in secluded places where the public very seldom or never visits and often on banks of streams furnishing domestic water supply. Some of them are located on farms and private property where it has been the custom to slaughter animals for public consumption, without control or license in the matter of inspection or sale. Sometimes the law forbids it, but a law is impotent unless it is enforced.

The paradoxical situation is this: while our children have been systematically taught the principles of hygiene in our schools, it has as systematically been ignored in law. In the vast unorganized districts of this province and in the northwest provinces it has been the custom to slaughter animals for public consumption anywhere without inspection or supervision. Doubtful animals and animals known to be diseased have been driven out of incorporated communities to the rural slaughter to evade the municipal restrictions. I once saw a cow, rotten with tuberculosis, being driven in a round about way to a rural slaughter house

to escape detection by the municipal veterinary inspector. The animal was occasionally seized with paroxysmal fits of coughing due to being forced to go faster than she was able. Fortunately an officer of the S. P. C. A. saw it also and had it followed up in a blue cross float to the slaughter house. It was found on examination by a veterinary surgeon that its lungs were literally choked with tubercles. The carcass was condemned and the driver and owner were severely fined.

Where there are no S. P. C. A. officers looking after such things it is easy to imagine what state of matters exist in unorganized districts.

In this free country, where animals for human consumption are killed at any time and anywhere without inspection or supervision, it is both freedom without license and license without freedom. I have seen animals slaughtered for public consumption on farms and private places, to which dogs, pigs, chickens, cats, rats, mice, and fowls and even coyotes had access, before removal to the meat market. Butchers as a rule are very scrupulous and generally want to do an honest business, but in many instances circumstances are against them; besides, an honest butcher's trade is unprotected, without proper and adequate laws. How can a butcher be expected to keep his slaughter house in an hygienic condition if legislation does not protect him from the universal peddling system of farmers and go-betweens? Not long ago I saw a gentleman who is a member of a missionary society, in connection with a popular church, actually bring a dead born calf to a village butcher for sale.

I have known pigs to die of pneumonia and subsequently frozen, to be consumed by Chinamen as a delicacy. In fact, Chinamen will eat pork no matter what the cause of death, so long as putrefaction is not too far advanced.

When I was in private practice in Alberta, one dark winter night I had the misfortune to have my team cut up badly on a barb wire fence. It was about 20° below zero when I arrived at a Gallician settler's house for shelter. After ligating my horses' bleeding arteries with strips from my shirt and having placed the horses between two haystacks, I was glad to get inside, but the stench of that mud constructed domicile soon drove me out again, but not before the old Gallician man proffered me drink and food. He desired to supplement his hospitality by add' g a cut or two

of veal. On the mention of meat my eyes instinctively scanned the entire room for a possible place where a good piece of meat could be properly kept, when to my utter astonishment and disgust, my host pulled from underneath the blankets of a large wooden bed, in which his old spouse lay smiling and giving him culinary directions, the carcass of a small calf. It was evidently placed there to keep it from freezing.

That Gallician drove me back to town in the morning, more sick from the stench of that house than the cold; needless to say he also brought in the veal and sold it to the local butcher.

In winter time in these northern latitudes, when meat depends more on the outside temperatures for its set than on the health of the animal for its firmness, there is little room left in our minds to doubt that many animals dying from blackleg, injuries, etc., find their way to the meat markets of unorganized districts. So long as the carcasses are subject to winter temperatures, i. e., frozen, their real condition remains disguised. When only a piece at a time is chopped off and cooked immediately and as quickly consumed, it is little wonder that suspicion is not very often entertained.

I have watched this sort of thing for years and have no doubt that sometimes, and often, animals which are seriously injured and doctored until no further hope of recovery is entertained, the animal is destroyed, and if it happens to be a horse the pigs probably will be given the opportunity to dispose of it. If it be a cow or a steer, if the owner is unscrupulous, he will bleed it and take it some distance to a meat market, invariably avoiding the local butcher. I have no doubt after my experiences that many such cases occur in this country in winter, when, as I said, the set of the meat does not depend so much on the health of the animal as it does on the temperature for its firmness. It is a very palpable excuse to attribute the hardness of the meat to an accident of temperature.

If animals intended for human consumption were slaughtered under the inspection of competent provincial or county officers at *communal* slaughter houses, specifically constructed to meet the demands of ordinary hygienic principles, and the animals inspected before and after they are killed, the benefit to the public health would be incalculable and another source of doubt and fear in the minds of the intelligent class would be removed. When-

ever possible the inspector should be a competent veterinary adviser to the provincial board of health. While it is universally admitted that the veterinarian will never enjoy the professional status in the same measure as his medical confrere, it is as widely conceded that his services are absolutely indispensable in the control of diseases communicable to mankind from the lower animals.

The vital importance of the services of competent veterinary scientists to the health and welfare of mankind is today, as never before, universally appreciated. There is such an enormous demand for graduate veterinary surgeons with the allied armies and civilian boards of health that they are being accepted up to fifty years of age, which in itself is indisputable proof of the value and nature of their services.

To instance the opinion of leading thinkers that the veterinarian is the properly qualified authority in the detection of disease transmissible from the lower creation to man, I may say when I was a youth I lived in Scotland where I first studied veterinary science. I knew a whole family that sickened and died of tuberculosis. Each of them was in turn attended by the family physician, who in every case pronounced it tuberculosis, but failed to point out the origin of of the outbreak, confining himself to the stereotyped remark that it was "hereditary." We know now that while a weak tissue may be hereditary, the disease commonly known as consumption is due to a specific germ gaining access to the internal organs. The origin of infection which wiped out that susceptible Scotch family was not suspected until the family cow also became sick and the local veterinary surgeon called in to doctor the cow discovered it far advanced in tuberculosis; but it was then too late, for almost the entire family had by that time become extinct. I venture to opine that out of the millions that silently fall, the ravages of tuberculosis far exceeds that of alcohol, but the results of alcohol are manifestly more glaring. Of course a good many cases of disease obtained from the domesticated animals are not immediately fatal, but their ravages are so terrible that they might as well be.

I have seen cattle dying of blackleg frequently dried and consumed by American Indians and a good deal of fresh meat not inspected is shipped to our meat markets by Indians. I made mention of the laws of preservation and destruction, as personified by Vishnu and Siva, the two great East Indian deities; the allied

governments of today are contributing billions of dollars worth of wealth and millions of their best men—*not* to feed the law of destruction, as some people erroneously think, but the law of preservation, because the law which governs destruction in this case started in Germany like a forest fire, fanned by the absurd philosophy that might is right. It will take all the power of organized wealth and the best of human efforts to extinguish the military conflagration. It would only have taken one tithe of the expense to have prevented it, by applying to it the law of preservation, or in other words, preparation, in the first place.

The physical health of a people is based on the same principle or law and if that people gave adequate attention, i. e., effort and wealth to the law of preservation, the law of destruction would be successfully controlled. God cares *not* whether we worship the law of preservation or destruction, we are the victims of our own iniquities. Before the war many of us were good church going folk, listening to our eloquent preachers on the future state and happy hunting grounds, lost in spiritual reveries, pleasantly oblivious to our physical needs; whilst all the time our enemies were forging many systems for our physical destruction. Not until our best manhood was being slaughtered less mercifully than we kill our kine, did we wake up to our vulnerability and the stern reality of it all.

The law of physical destruction does not always attack us from the same direction or by the same methods but always at the most vulnerable salient. There are insidious methods of destruction in which we hear no roaring cannon, no bursting shells or mighty explosions of mines; no sharp exclamations of human pain, as on the battlefield, amidst shouts of victory and other deafening din which necessarily accompany such engagements of mortal strife. I allude to those countless millions who *silently* fall, which began with the world and probably will continue to the end. It is the war of physical health versus disease in which the form and size of the combatants are relatively insignificant and the results are just as appalling. This is the twentieth century and despite all scientific discovery proclaimed from the housetops, people practically are not availing themselves of the knowledge of preservation to an adequate degree, consequently the law of creation has been doing double time to keep pace with the law of destruction. If people hugged their physical sciences as much as their old testa-

ments they would have better bodies and therefore better souls. The glorification of God is the real objective of man and the highest possible results are only obtainable in the enjoyment of healthy physical bodies. The pursuit and prosecution of physical health is of paramount importance. We have our spiritual leaders, our political leaders, as well as our physical leaders, but if the latter do not perform their maximum duty the former suffer in consequence; for let little unconscious children, who have a vague conception of God, become infected through the medium of the inexorable law of destruction, all the prayers of all the religious people in the world could not save them from physical death. My observations and studies in both the Occident and the Orient have taught me that all true knowledge is not exclusively confined to the spiritual side of man's nature, but that truth can be abundantly found in the field of physical research and activity. To the diligent, science has uncovered truths that the hands can feel, the eyes see and the ears hear. Any controversion of these facts, that they are merely the deductions of the senses, is tantamount to saying that the sun does not shine. Therefore the time is ripe for a complete awakening to these facts, for better facilities of prosecuting physical health, better laws for preservation of health, and better recognition of veterinary science, as applied by competent veterinarians in the welfare of public health.

If my remarks, which can be said to be in the vanguard for the preservation of the public health, succeed in arresting the serious attention of my colleagues and those concerned to the wisdom and necessity of combined effort against the evil of the private slaughter houses, uninspected meat and milk, untested dairy cows, unsupervised meat markets and dairies, in the *unorganized* communities of this province, and extend to these communities all the ordinary facilities and protection that municipalities are afforded, I shall indeed be happy in the knowledge that the day is not far off when we shall be able to boast that our civilization is second to none.

—The dates of the Ohio State Veterinary Medical Association have been changed from January 10 and 11 to January 8 and 9. A strong program has been arranged and a large attendance is assured.

FELLOWSHIP*

O. A. LONGLEY, Oakland, Calif.

At our last meeting I mentioned the word "Fellowship" and suggested that its full meaning be defined and recorded in such a manner that it be expressly understood by all members as being one of the prime factors in the spirit and principle upon which the organization of this association is founded.

In reviewing the constitution and by-laws of other veterinary organizations, I find that the word is invariably used; that the promotion of good fellowship is always one of the blocks of their foundations. With a desire to have a clear understanding of the basic principles underlying the society in which I was enrolling, I undertook to gain a fuller knowledge of the meaning of the word. Its definition started a chain of thought that, to me, became interesting and, as the small boy says when undertaking to compose his first letter, "I take my pen in hand, etc."

Webster defines Fellowship as follows:

> "To accept in good standing according to the requirements of some standard of faith or practice. In general, to associate with."
>
> Again: "The condition of being sharers or partakers; community of interest, condition or feeling; joint interest or experience."
>
> Another: "A body of persons associated by reason of a community of taste, views or interests."

The more one thinks of the broad meaning of Fellowship and the principles involved therein, the more convincing becomes its importance in an association of this kind. Fellowship deserves to be more than just one of the blocks of our foundation; it is entitled to the honored position of "cornerstone."

For the purpose of illustration and comparison, let us say that there are three ruling principles that bind persons together: love, friendship and fellowship.

With love we are not concerned here, assuming, of course, that he who is brave enough to live the life of a veterinarian is strong enough to be above the possibility of being afflicted with sexual perversion; therefore no love is lost or gained at these meetings.

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*Read at meeting of Bay Counties Veterinary Medical Association, San Francisco, Nov. 21, 1917.

Friendship plays a part in our meetings, in fact, a large part, for it is a source of real pleasure to each one of us that these gatherings afford opportunities for friends to meet, chat nonsense or talk over intimate experiences that perhaps one would not wish to discuss in open meeting. The friendly social atmosphere of these meetings invariably sends us home feeling better for having attended, for no better stimulant exists than mixing with congenial friends.

Fellowship, however, is the big and important factor that should and does prevail. Regardless of how you feel toward your fellow veterinarian, you attend these meetings in a spirit of fellowship. To associate together as veterinarians is fellowship, for we all accept each other as associates, sharers and partakers in a profession in which we all have a community of or joint interest. By discussing our experiences we are following the teachings of fellowship, whether we like or dislike those with whom we discourse. Fellowship does not bar even enemies meeting together in joint interest and if there is a feeling of hate by some attending toward others present, the fact that both individuals are present does not detract in the least from exercising the fullest measure of fellowship, with its attendant benefit to both. Of course, fellowship amongst friends is more pleasant, but fellowship with those one dislikes is equally as beneficial and sometimes more lively.

Referring again to the definition of fellowship as found in Webster's, let us remember that this is "A body of persons associated by reason of a community of taste, views and interest.' This definition brings to mind the word "co-operation." No better method exists whereby our community interests can best be served and advanced than by co-operation. Why Webster left the word co-operation out of his definition for fellowship, I cannot understand. It seems to me that it belongs there. It is very evident that the present tendency in every line of endeavor is toward a closer and more sincere co-operation. The business men of a city co-operate to advertise and boost their city. Cities co-operate to build up their section of the state. States co-operate to protect our country and many nations are now co-operating to protect democracy and civilization.

Men are learning more and more that it is to their advantage to work together for their mutual benefit. Never has the veterinary profession been more in need of co-operation than now. Con-

ditions have changed and are still changing, with more changes and new conditions to follow. This has necessitated changes in our methods of practice and new education along different lines, in all of which co-operation must of necessity play an important part.

I do not mean to infer that co-operation does not now exist, for it does and on a grand scale in California. The short courses provided by the University of California are very commendable examples and the organization of local veterinary associations are others. Such activities serve to bring us closer together and increase each veterinarian's share in the whole scheme of community interest.

I am convinced that no veterinarian regrets seeing another veterinarian succeed. Each may profit by observing wherein the other succeeds, use the suggestion to make his own practice better and then work together with the other to make the practice of both better. Such is real co-operation and it can only be accomplished by fellowship.

We need to learn from each the experience and ideas of the other. We need to realize that the success of any one of us means more business for the others. The more we strive to serve each other the more all will succeed.

To those who do not wish to give their fellows the experiences and methods that to themselves have proved successful, let me put it gently by saying such a course is selfishness. If such a one desires to be genuinely selfish, let him prepare a paper or address our meeting on any subject, for no man can prepare himself to present any subject without the result of being of greater benefit to himself than to any of his listeners.

Therefore let good fellowship prevail in all our meetings, for thereby will the greatest measure of benefit be derived by each member. Carry the feeling home with you and don't lose it between meetings; bring it back with you and our success as an association and as individuals is assured.

—Dr. E. V. Hover has removed from Convoy to Defiance, Ohio. Dr. Hover is in charge of the five northwest counties of Ohio in intensive hog cholera control work under the direction of Dr. L. P. Beechy, B. A. I. Inspector in charge of Ohio.

CLINICAL AND CASE REPORTS

GASTRO-INTESTINAL LAVAGE IN DOGS: ITS VALUE IN REMOVING WORMS AND IN OTHER RESPECTS

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From evidence obtained in conversation and correspondence, it appears that the use of gastro-intestinal lavage, washing out the digestive tract with a stream of water administered by rectum as an enema and continued until it issues from the mouth by repeated emesis, for the removal of worms from dogs and cats, is rather common practice among veterinarians in this country. In spite of this, there seem to be almost no published references to the practice and it is unknown to many veterinarians of long standing. It has therefore seemed worth while to conduct some investigations in regard to this form of lavage in connection with some anthelmintic investigations, to ascertain the efficacy of this mechanical method of removing worms in comparison with the customary medicinal procedure, and also to note its immediate and remote effect on the host animal and its possibilities as a mode of administering medication.

Sisson (1914) states regarding the digestive tract of the dog: "There is an ileocolic valve. * * The valve does not seem always to be efficient, since experience shows that rectal injections can be made to pass beyond it. This may be partly due also to the fact that the terminal part of the ileum runs horizontally forward, and its orifice faces forward into the beginning of the colon."

It appears that the corresponding valve in the cat is likewise pervious, since fluids may pass from the rectum and colon to the small intestine, and it may be that this is generally true of carnivores. This is practically the limit of applicability of the method of gastro-intestinal lavage, as there are obvious anatomical, physiological, practical or aesthetic objections to its use in the case of such animals as horses, cattle, sheep, hogs or man.

Quitman (1917) describes and discusses the method of gastro-intestinal lavage as follows:

"In the dog, I vary my vermifuge treatment. In my own hospital practice, we usually make very quick and thorough work with gastro-intestinal lavage. The method works so well that we

are getting a special clientele on that score alone. We first administer a thorough purgative, preferably a saline, to empty the bowels, of course, as much as possible. Then with just ordinary soap solution, using several gallons, we first free the bowels of all material by letting a certain amount run in and letting it be ejected again, and finally after a little while, especially helped by elevation of the hind quarters of the dog, the fluid will come out of his mouth as fast as it runs into the rectum. This is the most efficacious method, as it will wash out every worm in the dog; it tends to wash out the ova and also free the system of the excretions of the worms that so often seem to cause various forms of toxemia, After flushing the dog with the soap solution, we usually flush him freely with a normal salt solution, expecting some of that to remain, which will tend to ward off the slight prostration that sometimes results from the operation. If the dog is very weak, we postpone the gastro-intestinal lavage until we get him braced up."

In response to a personal letter from one of us (Hall), Doctor Quitman very kindly furnished the following additional information in regard to this treatment:

"In regard to the gastro-intestinal lavage treatment for the removal of parasites, I have never seen the method in print. I first saw it used by Dr. Charles A. White of 216 East 26th St., Chicago, professor of canine medicine and surgery at the Chicago Veterinary College, about 15 years ago. It is without a doubt the safest, surest method (when done correctly) of removing all varieties of intestinal parasites. I have used the method ever since I first saw White demonstrate it. I use it in my hospital at least 25 or 30 times monthly, counting individual dogs and not repetitions (I like to give two treatments, three or four days apart).

I prefer purging the animal first, but circumstances do not always permit this preliminary. If not, we gradually wash out the intestines, allowing the animal to force out the water and feces before filling the bowels and elevating the hind part of the body and preventing back expulsion by pressure on anus. One case in 100 may be found difficult; when so, administer 1/20 to 1/10 gr. apomorphine hyd. and again fill them up, when the fluid will come through. I use sometimes a gallon of warm soap emulsion, always followed up with a gallon of warm normal salt solution, and sometimes only the normal salt solution.

"It also operates well in cats. * * * Dr. White may be

able to give you more of the history, as I do not know whether he originated the idea or not."

We are unaware of any European work, or work elsewhere outside of the United States, dealing with this topic, but we have made no effort to ascertain what literature of the sort may exist.

Our own experiments with this method comprise washing out the gastro-intestinal tract in various ways, examining the material washed out, and usually keeping the animals for some days and examining all feces or vomitus for worms that might have been unfavorably affected by the lavage and subsequently passed. The injection of the water was accomplished by gravity—using a funnel and tube—or by a force pump or city water pressure. The dogs were killed at the end of the experiments and examined for worms and for pathological lesions, especially those of the digestive tract. A detailed statement of the experiments is as follows:

Dog No. 114, a mongrel weighing 4.5 kilos, was washed out with an indefinite amount of tap water, no worms being discovered in the water vomited by the dog. On postmortem examination 3 days later, the dog was found to have 3 *Dipylidium* and 1 whipworm. The gastric mucosa was slightly paler than normal. The treatment appeared to be entirely ineffective in this case, and apparently uninjurious to the animal.

Dog No. 124, a small wire-haired terrier, was washed out with an indefinite amount of tap water; no worms were found in this water. The dog was killed immediately after treatment and found to have 1 ascarid and 1 whipworm. The entire digestive tract appeared anemic and edematous as a result of the washing. The treatment was entirely ineffective.

Dog No. 125, a small terrier, was washed out with an indefinite amount of tap water. No worms were removed and none were found on postmortem examination immediately after treatment, so no conclusions could be drawn regarding efficiency. However, the abdominal cavity was found to contain a blood-stained fluid, and the origin of the blood was found in 2 large ruptures of the jejunum and one of the colon, and 3 lesser breaks in the colon. The large breaks were an inch long or longer. All ruptures involved the serosa and the muscular coat, but the mucosa was not apparently broken. The intestine also showed numerous submucous hemorrhages. The damage was obviously due to the pressure of the water, and it is evident that there is a certain danger here.

Should the initial washing out of the large intestine fail to remove all hard fecal masses, one of these might easily occlude the ileocolic valve and lead to rupture of the large intestine as a result of the back pressure, and food masses, hair balls, worm knots, etc., in the stomach might occlude the esophageal aperture, leading to rupture of the coats of the small intestine or the stomach. A spastic condition of the ileocolic valve or the pylorus, or a moderate degree of stenosis at some point, might give similar results.

Dog No. 126, a small terrier, was washed out with an indefinite amount of tap water. The washing removed 1 ascarid and on postmortem immediately afterward the dog was found to have one more. The treatment was therefore 50 per cent effective against ascarids. The entire digestive tract was anemic and edematous as a result of the washing.

Dog No. 119, a mongrel weighing 15.5 kilos, was washed out with 8 liters of soap solution, followed by a half liter of normal salt solution, and this in turn followed by a considerable, but unmeasured, amount of tap water. Six hookworms were washed out in this way. One hookworm was passed in the feces collected on the third day, and on postmortem examination the third day another hookworm was found in the large intestine, dead and being passed out. This total of 8 hookworms was credited to the efficacy of the lavage. However, the dog had 157 hookworms and 54 whipworms in addition. The treatment was therefore 5 per cent effective against hookworms and 0 per cent effective against whipworms. The stomach was normal; the small intestine showed petechiae due to hookworms; the colon showed one large, discrete inflamed area and one or two small hemorrhagic areas; the tip of the cecum, covering the area from which the whipworms were removed, was moderately inflamed, a lesion which we commonly find associated with, and evidently due to, whipworms. There was evidently a complete recovery from the anemic edematous condition produced by the lavage (it would be expected that this condition would be transitory), and it may be doubted whether any of the lesions noted could be attributed to the treatment.

Dog No. 121, a mongrel weighing 12.75 kilos, was washed out with 8 liters of soap solution followed by a half liter of normal salt solution. No worms were washed out and none passed during the next 8 days. The dog was then treated with oil of chenopodium, but passed no worms during the next four days. Postmortem

examination showed the presence of 28 whipworms. The lavage, as well as the oil of chenopodium, was 0 per cent effective against the whipworms. The digestive tract was normal.

Dog No. 128, a bulldog weighing 10 kilos, was washed out with an indefinite amount of soap solution at the clinic at the joint meeting of the Michigan and Northwestern Ohio Veterinary Medical Association of 1917. No worms were removed by the washing. Postmortem examination immediately after treatment showed the presence of a number of hookworms and *Dipylidium*, the number not being counted owing to the limited time and facilities. The treatment was 0 per cent effective against hookworms and *Dipylidium*. The small intestine showed petechiae due to hookworm and a slight inflammation of the ileum; aside from this, the only thing noted was the edematous condition of the digestive tract as a result of the washing, a condition which, as already noted, is probably transient.

Dog No. 209, a mongrel weighing 9 kilos, was treated by gastro-intestinal lavage, using 8 liters of water. The lavage washed out 2 entire specimens of *Taenia pisiformis*. The dog was killed the next day and found to have 7 specimens of *T. pisiformis*. The lavage was therefore only 22 per cent effective against *Taenia*. There were numerous petechiae in the cardiac and pyloric ends of the stomach, possibly due to the strain of vomiting. The small intestine was mildly inflamed, except where the tapeworms lay in the jejunum, and here the mucosa was highly inflamed and showed some hemorrhage.

The following experiments involve the use of gastro-intestinal lavage, but are complicated by other features.

Dog No. 135, a mongrel weighing 9 kilos, was washed out with 200 mils of a 1 per cent solution of copper sulphate, then with an indefinite amount of tap water, then with another 200 mils of copper sulphate solution, then with an indefinite amount of tap water again. The treatment brought away 1 headless *Dipylidium* stained blue with copper sulphate; no more worms were passed and the dog was found free from worms on postmortem examination the fourth day after treatment. The treatment was therefore 100 per cent effective against *Dipylidium*. However, the addition of the copper sulphate complicates the case, as it is no longer a mechanical removal of the worm which is involved, but a medicinal treatment which is given by rectum instead of by

mouth, merely a modification here of the common rectal medication. Copper sulphate is well known as an anthelmintic for use against stomach worm in ruminants; it cannot be given by mouth to dogs for this purpose, owing to its decided emetic action. In this experiment, the copper sulphate also gave rise to serious lesions. The entire digestive tract was inflamed and hemorrhagic, the liver cirrhotic, and the kidneys were inflamed and showed what were apparently streaks of degeneration. The lesions of the digestive tract, at least, must be attributed to this treatment. The hemorrhagic condition of the digestive tract and the resultant blood in the feces, with the dog in a weakened condition, led to the dog developing a case of rectal myiasis from infestation with blowfly larvae. This was successfully treated with a rectal injection of 25 to 30 mils of olive oil containing 30 per cent chloroform, and none of the larvae were found postmortem.

Dog No. 187, a mongrel weighing 10 kilos, was given 6 grains of calomel the day before treatment. The day of treatment the dog was given a rectal injection prepared by dissolving 2 grams of beta-naphthol in 9 mils of 95 per cent alcohol and adding this to 1000 mils of water to give a finely divided watery suspension of the drug. The day of treatment the calomel had failed to purge the dog, so the rectum and colon were thoroughly flushed out with tap water, and then the rectal injection of beta-naphthol was given. Evidently the amount given was too much for the dog's large intestine, and though it was not intended as gastro-intestinal lavage, the animal vomited a half-hour later, vomiting a headless *Dipylidium*, indicative of the passage of the drug into the small intestine. The dog passed no feces the next 3 days and died on the fourth or fifth day. There were no worms found postmortem, so the treatment was 100 per cent effective against *Dipylidium*. The stomach was inflamed and catarrhal and contained fecal matter; the intestines were inflamed. Like the previous experiment, this is really rectal medication, not gastro-intestinal lavage, and while effective against *Dipylidium* it exerted a bad effect on the digestive tract.

Dog No. 172, a mongrel weighing 10 kilos, was given an enema in order to secure a fecal sample to examine for the presence of parasite eggs. This is a routine procedure with us; a piece of flexible rubber tubing about 3 feet long and approximately a half inch in outside diameter is connected to a tap and the hot and cold

water mixed to give a moderate-sized, warm stream. In this case it would appear that the enema had been continued until the water entered the small intestine, for presently the dog passed the fluid and it was found to contain about 20 entire *Dipylidium*. While these worms might have been in the large intestine on their way out, we assume that they were not. The dog was then given a lethal dose of oleoresin of male fern as a check on some other tests. The next day the dog was very sick. It had occurred to us, and Dr. Horace Hoskins made the same point in conversation with one of us (Hall), that this lavage might be of value in cases of poisoning, so we used the lavage treatment on this dog, though the long time since the male fern had been given made it unlikely that lavage would be of value. The dog died the evening of the fifth day after treatment with male fern. Postmortem showed the absence of any parasites, so the unintentional lavage effect—an enema carried to the point where it entered the small intestine and then passed out again by way of the rectum instead of the mouth—was apparently 100 per cent effective against *Dipylidium*. The failure to be of value in poisoning in this case is readily explained by the long interval between the administration of the poison and the lavage.

The value of lavage in cases of poisoning was tested as follows:

Dog No. 204, a terrier weighing 9.5 kilos, was given 20 mils of oleoresin of male fern, a lethal dose. The dog had a temperature of 104 at the time and showed indications of distemper. One hour after treatment the dog was given gastro-intestinal lavage, using about 6 liters of water, which washed out quite a little male fern, and incidentally brought away 3 ascarids. The next day the dog was weak and progressive emaciation was noticeable during the next few days. The dog died the seventh day after treatment. Postmortem examination showed the patchy pneumonia of distemper and a hemorrhagic gastritis and enteritis. No parasites were present, so the combination of male fern in lethal dose and lavage was 100 per cent effective against ascarids. The lavage failed to save the life of the dog, but the failure was very likely due to the fact that this dog was sick with distemper before treatment, and that the weakened and diseased organism did not have the resistance and vitality to endure the local irritation and toxic effects of the male fern or the shock of lavage. There was more

or less likelihood of the animal dying from distemper, even without the administration of male fern, and in our opinion the use of lavage within an hour or so after the administration of a lethal dose of male fern to a healthy dog would usually save the animal. Even in this case, the dog did not show the trembling which we usually find in dogs suffering from the toxic effects of male fern, and the gastro-intestinal hemorrhage, due in part, at least, to the male fern, was the principal injurious action of the drug.

Another test of lavage in poisoning was as follows:

Dog No. 203, a terrier weighing 10 kilos, was given 1 grain of strychnine sulphate in the form of a powder placed on the back of the tongue and washed down with a little water. Gastro-intestinal lavage was then begun immediately with a rubber tube attached to a tap, and the dog vomited the first of the injected water about 5 minutes after the strychnine was swallowed. About 4 liters of water were vomited by the dog, incidentally bringing away 15 *Dipylidium*. About a half hour later, the dog pitched forward in the characteristic tonic spasm of strychnine. While still rigid, the animal was picked up and filled full of cool water by rectum till it vomited once, on the theory that the cool water filling the digestive tract might exert a depressant effect which would counteract to some extent the stimulant effect of the strychnine. The rigidity soon passed away and the animal showed no more bad effects from the strychnine. The next day, the dog was running about and eating heartily. The dog was killed on the seventh day after treatment and showed a normal digestive tract and no lesions attributable to the strychnine or the lavage. There were, however, 95 *Dipylidium*, many of them being large, complete strobila. The lavage was, therefore, only 14 per cent effective against *Dipylidium*. The dose of strychnine given was three to ten times that regarded as a lethal dose, and there is no question but what the use of lavage saved the life of the dog in this instance. Of course, in practice a veterinarian could not get to a dog given a grain of strychnine in time to save it by lavage or any other method, but where a poison is still present in the stomach, the use of lavage appears to be one of the first things indicated. It is likely that the simultaneous use of apomorphine hydrochloride, 1/5 to 1/10 of a grain, subcutaneously, would be of value in this connection, but the apomorphine alone does not seem to us as useful as the combination, because it is possible for drugs of vary-

ing physical composition and consistency to adhere to the stomach walls or lie along the greater curvature in such a way that mere vomiting will not remove them, and actual washing with large amounts of water, thereby dissolving the drugs or forcibly washing them out, is called for. It is also known that apomorphine may fail to produce emesis in narcotic poisoning.

In passing, it might be noted that dogs usually offer but little resistance to gastro-intestinal lavage, and that those which are at first inclined to resist become very subdued during the course of the operation.

An examination of the results in the tests of lavage alone in the foregoing shows: Five dogs were washed out with a plentiful, but unmeasured, amount of tap water, and killed immediately after treatment; the treatment was 0 per cent effective against ascarids once, against hookworms once, against whipworms twice, against *Dipylidium* twice, was 50 per cent effective against ascarids once, and in one case the absence of worms prevented any conclusions. Two dogs were washed out with 8 liters of soap solution, followed by a half liter of normal saline, and in one of these cases this in turn was followed by an indefinite amount of tap water; one of these dogs was killed on the third day and the other on the twelfth day after treatment; the treatment was 0 per cent effective against whipworms in both cases and 5 per cent effective against hookworms in one case. Another dog was washed out with 8 liters of tap water; the dog was killed the next day and the treatment found to be 22 per cent effective against *Taenia*. One dog was given an enema with an indefinite amount of tap water; the dog died the fifth day after and the treatment found to be apparently 100 per cent effective against *Dipylidium*. Another dog was washed out with 4 liters of tap water; the dog was killed 7 days later and the treatment found to be 14 per cent effective against *Dipylidium*. These tests on 9 dogs show a percentage efficacy against various species of worms of zero in 8 instances, of 5 in 1 instance, of 14 in 1 instance, of 22 in 1 instance, of 50 in 1 instance, and of 100 in 1 instance. The fact that the efficacy is zero in 8 out of 13 instances, and below 50 per cent in 11 out of 13 instances, indicates rather definitely that this treatment has limited anthelmintic value.

The 2 cases where drugs were added to the lavage must be considered rectal medication and disregarded, so far as the treatment

called gastro-intestinal lavage is concerned, and the treatment combining lavage and male fern must also be disregarded in the case of dog No. 204, so far as the efficacy of simple gastro-intestinal lavage is concerned.

It will be noted that all our tests deal only with a single lavage treatment, which we regard as a fair test, although Doctor Quitman states that he likes to give repeated treatments. In this connection we also note the following statement by Quitman (1917):

"I have maintained for many years that this thing of giving one or two doses of a vermifuge or vermicide and then considering the patient free from worms, is an error. We should do it, so as to relieve the animal as quickly as possible of the multitude of parasites that he perhaps has in him, but there is no vermicide that destroys the ova. What are we going to do as these ova hatch out? Oddly enough, according to my observations, it seems that adult worms succumb more readily to vermicides than do young worms."

We are in entire agreement with Doctor Quitman regarding the inadequacy of considering a patient free from worms because anthelmintic treatment has been given, or even, we might add, because worms have been passed after the treatment. We are likewise of the opinion that young worms are more resistant to anthelmintic treatment than are mature worms, and might add further that we agree with Railliet (1915) that large worms are apparently more vulnerable than small ones. But we do not regard the fact that anthelmintics are innocuous to worm eggs as an argument in favor of gastro-intestinal lavage or against anthelmintics in single or repeated doses. Peristalsis alone will remove these eggs, which will require a certain length of time for development before they are capable of infecting another dog, and the disposal of this infective material is a problem in sanitation, not a matter of anthelmintics or lavage.

The use of gastro-intestinal lavage has raised in our mind some questions as to the gastric capacity of the average dog, the gastric capacity per kilo of weight of dog, and, incidentally, the weight of the average dog. These are matters of interest in comparing anthelmintic treatments of the dog and of man.

In the work on anthelmintics by Hall and Foster in the U. S. Bureau of Animal Industry and by Hall at Detroit, the weight of the average dog has been arbitrarily regarded as 10 kilos (22 pounds), with the idea that this was very close to the correct

weight and was a convenient figure on which to compute doses. There are now available to us here the weights of 200 dogs on which to base an estimate of the average dog's weight. These dogs were from the Detroit city pound and may be regarded as representative. They do not include the toy varieties on the one hand nor the largest breed, such as the Great Dane, St. Bernard, or Newfoundland on the other, two groups which may be roughly regarded as offsetting one another. The smallest dog in the series weighs 3 kilos and the largest 25 kilos. The average weight is 10.57 kilos. The figures warrant the designation of 10 kilos as the weight of the average dog. A graph indicates that the peak for weights, also, is reached around 10 kilos.

Sisson (1914) says of the dog:

"The stomach is relatively large. Its capacity in a dog weighing about 40 pounds is about 6 to 7 pints. Colin estimates the average capacity at about 3 liters (ca. 6½ pints), with a range between 0.6 and 8 liters (ca. 1 1/3 to 17½ pints). Neumayer gives the capacity as 100 to 250 c.c. per kilogram of body-weight (ca. 2.7 ounces per pound). The average capacity of the human stomach is estimated at 1.2 liters (2½ pints)—not much more than a third of that of a dog of medium size."

Our own figures are based on the measurement of the stomachs of 25 dogs. In one or two cases, these stomachs were from dogs which had been dead a matter of hours, the stomachs being cold, but elastic and substantially as easily measured for capacity as the stomachs of freshly killed dogs. The other stomachs were from freshly killed dogs. The stomachs were detached at the entrance of the esophagus and at the pyloric aperture and were filled with water until the stomach was full and distended with the weight. This water was then poured into a large graduate and measured. The table of weights and measurements is as follows:

Dog Number	Capacity in mils	Weight in Kilos	Capacity per Kilo
175	560	19	29.5
177	1140	15	76.0
183	1190	11.5	103.5
184	160	5.5	29.1
185	260	8.5	30.6
187	460	10	46.0
188	470	9	52.2
190	1160	11	105.5
191	810	8.5	95.3
192	840	10.5	80.0
193	850	9	94.4
194	1860	13	143.1
195	1210	10	121.0
196	1085	9.5	114.2
197	3100	17	182.4
198	475	10	47.5
200	1300	18.5	70.3
201	1200	11.5	104.3
209	500	9	55.6
208	475	9.5	50.0
207	370	10.5	35.2
205	880	7.75	113.5
206	780	9	86.6
203	1250	10	125.0
204	460	9.5	48.4

The average stomach capacity for these 25 dogs is 913.8 mils, and the average capacity per kilo of weight of dog is 81.6 mils. The smallest stomach capacity, 160 mils, and the smallest capacity per kilo, 29.1 mils, are those of the smallest dog, No. 184, weighing 5.5 kilos, the stomach of which was cold when measured, the dog having been found dead instead of being freshly killed as in the case of nearly all the other dogs. The largest stomach capacity, 3100 mils, and the largest capacity per kilo, 182.4 mils, are those of dog No. 197, weighing 17 kilos. It will be noticed that this is not the largest dog: Dog No. 200, weighing 18.5 kilos, had a stomach capacity of 1300 mils and a capacity per kilo of 70.3 mils, while the largest dog, No. 175, had the surprisingly small stomach capacity of 560 mils and a capacity per kilo of only 29.5 mils.

Taking the average weight of a dog as 10 kilos, an assumption warranted by our weights of 200 dogs, and the average capacity per kilo as 81.6 mils, as determined above, the average capacity of a dog's stomach would be 816 mils. Taking this in connection with our findings of 913.8 mils as the average capacity for 25 dogs, we are of the opinion that for working purposes one may assume that the average dog weighs 10 kilos and has a stomach capacity of 1 liter. Our figures indicate that it would be actually smaller

than 1 liter. In the quotation from Sisson (1914) it will be noted that the average capacity of the human stomach is estimated at 1.2 liters. We find that some texts on human anatomy state the capacity of the stomach of the human male as 2.5 to 4 liters. It would appear, therefore, that the stomach of the average dog is smaller, not larger, than that of the average person.

For the convenience of those unaccustomed to the metric system, it may be stated that a kilo, or kilogram, is equivalent to 2.2 pounds, and that a liter is equivalent to 2.1 pints.

Summary. Experimental investigations of various procedures which may be regarded as gastro-intestinal lavage in the sense in which the term is now used among American veterinarians, or some modification of that procedure, have been made by us in 12 cases. We conclude from these tests:

1. That gastro-intestinal lavage, like most of the medicinal anthelmintics, has not the entirely dependable efficacy which is usually credited to it by those who use it.

2. That it has a certain limited efficacy in removing worms and that it might be of value in anthelmintic treatment in one of several ways; by mechanically removing part of the worms present at times, or all of them less frequently, by removing material that interfered with the action of medicinal anthelmintics, or by employment as a means of administering medicinal anthelmintics in properly selected cases. Its anthelmintic value is less than that of properly selected medicinal anthelmintics in suitable doses.

3. That it probably has greater value in cases of poisoning in dogs or cats, animals which are often poisoned, where the lavage can be given in time to wash out some or all of the poison from the digestive tract before the absorption of a lethal dose. Where it could be applied promptly we would regard it as a procedure of great value.

4. That it is temporarily very depressing and may at times cause rupture of the intestinal walls from the water pressure, or hemorrhage of the stomach from protracted forcible emesis.

5. That the treatment is easy and rapid with some dogs, but slow and tedious with others.

Investigations based on the weights of 200 dogs indicate that for practical purposes the weight of the average dog is about 10 kilos; investigations based on the above and on the measurement of 25 dog stomachs indicate that the gastric capacity of the aver-

age dog is about 1 liter and that the gastric capacity of the average dog per kilo of body weight is about 100 mils. The exact computed weight is a little over 10 kilos and the exact computed capacity and capacity per kilo are a little less than these figures.

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RECTO-VAGINAL FISTULA AND RECTO-VAGINAL FISSURE*

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In offering a few remarks on the above subject, the only object I have in view is to call your attention to a little variation from the ordinary methods of surgical treatment of these conditions.

That we may understand each other better, we will consider the real conditions to which these names are applicable and try to show in a measure how they occur.

Rectal-fistula is an extremely common condition in the human, resulting usually from hemorrhoids, the hemorrhoidal tumor breaking down and admitting foreign matter to the peri-rectal tissues, carrying with it infection, terminates in abscess formation; the pus working its way along the line of least resistance, opens into the rectum, producing incomplete rectal fistula, or working downward to the perineum gains exit and establishes a communication between the outer surface and the rectum, constituting complete rectal fistula. In some few cases it follows an opposite direction and gains exit into the bladder, urethra or some of their accessory organs. Hemorrhoids are not often, if ever, a cause of rectal fistula in the quadruped. The natural position assumed by the quadruped tends to draw the viscera into the abdominal cavity, relieving the weight in the pelvis, which is so pronounced in the hu-

*Portions of this paper have been presented at the meeting of the A. V. M. A. at Kansas City, Mo. and at the Minnesota-Wisconsin meeting at Lake City, Minn.

man. Again, the anal region in the quadruped is on or above the level of the heart, which greatly modifies blood pressure in the hemorrhoidal veins and is no doubt a prominent factor in producing dilatation and rupture of these veins in the animals assuming an upright position.

True we have some conditions in the lower animals which are spoken of as hemorrhoids, but they are apparently inflamed areas of mucous membrane, rather than dilatations of the hemorrhoidal veins, and are usually due to imperfect retraction of the prolapsed anal membrane that occurs during defecation, the sphincter ani contracting on the protruding membrane prevents the return flow of blood, and venous congestion soon follows.

Peri-rectal abscesses are by no means wanting in the quadruped, but they usually occur from other causes than those mentioned above. A puncture of the mucous membrane by various obstacles may result in peri-rectal abscesses which may or may not be followed by fistula.

A very large per cent of all the pathological conditions in this region, in the equine is found in the female and due to accidents during parturition.

Recto-vaginal fistula consists in a pathological opening from the rectum to the vagina and is usually the result of an injury inflicted by some part of the fetus during parturition and is probably, in most cases, the primary factor in recto-vaginal fissure, which is a dissolution of the continuity of the structures between the rectum and vagina from some point varying in distance from the ano-vaginal openings forward as much as 12 inches.

Experience has taught me that these fissures occur first as a fistula made ordinarily by the hoof of the fetus pointing upward as the result of a deflected limb, the limb when once deflected becomes flexed, the elbow or some other angle lodges on the pelvis or against some other part of the passage, the fetus is pushed backward, thus increasing the angle of the limb so the hoof is finally thrust upward so hard that it punctures the upper wall of the vagina, and in many cases the inferior wall of the rectum. With the foot thus engaged in these tissues, or protruding into the rectum, if the obstructed limb becomes disengaged, the fetus is expelled and the engaged foot tears the tissues from the point of the puncture back to, and including, the perineum, thus converting in many cases what was first a vaginal fistula into a recto-vaginal fissure.

When the foot has passed into the rectum, if the deflected limb is so firmly engaged that it prevents the expulsion of the fetus and assistance is rendered, the displaced member pushed back into its natural channel, delivery may be effected without further injury to the tissues and we have left a recto-vaginal fistula. These cases, however, are rather an exception to the rule. Again, the displaced foot may tear in another direction and puncture the perineum and if expelled in this condition, a vagino-perineum fissure is the result, or if the fetus is retained until assistance is rendered, the injury amounts to simply a vaginal fistula, involving the perineum.

Some years ago an accident of this kind happened to a mare belonging to the writer. The mare being expected to foal was left in a lot; on entering the enclosure the following morning, I found the mare was in labor, the head and one fore foot was presented in the natural channel, the elbow of the opposite side had become engaged on the brim of the pelvis, the foot pushed upward over the head and neck, had torn the upper wall of the vagina from a point some 12 inches anterior to the vulva, back to the anus, tore the sphincter ani in two, and the perineum down to a level of the vulva with the foot protruding to the fetlock. The rectum probably being empty had prevented the foot from tearing through the rectal membrane, and fortunately the elbow was so firmly fixed on the brim of the pelvis that further expulsion was impossible. I proceeded at once to replace the foot in its natural channel, and disengaged the elbow from its enlodgment, when delivery was affected without further assistance. The sphincter-ani was completely severed and fecal matter was involuntarily discharged, the animal having no control whatever of the rectum. Inasmuch as these tears had not involved the vulva, I believed the wound would close by granulation so did not suture it. Careful antiseptic irrigations two or three times a day were soon followed by complete healing of the parts and closing of the external wound. The sphincter ani, however, did not unite for some time and during the next five or six months, feces were involuntarily discharged, but by the end of that time, the sphincter ani had united and the mare was perfect in every way, in fact the healing was so complete that notwithstanding the mare was used for the purpose of examination for soundness by veterinary students for twelve or fifteen years after that time, it was rare for one to note any defect in this region. I must confess that I learned more about these injuries from watch-

ing this one case than I ever learned from all the text books I had been able to consult on the subject.

So far as personal experience goes, the treatment of recto-vaginal fistula and recto-vaginal fissure has been extremely difficult, in fact so difficult that for many years I refused to attempt to operate unless I could have perfect assurance that the rectum would be kept empty by frequent enemas, knowing full well that allowing the rectum to fill with fecal matter even once, any time within 15 to 18 days after the operation would completely destroy the suturing. The rectum is large and capable of holding quite an amount of feces, and when it becomes painful from operative procedure, defecation is very painful, which induces the animal to retain the feces as long as possible and when they are expelled they produce such intense dilatation of the anus that any mechanical union of the tissues is almost certain to be torn out. I find it is rare indeed that one can depend upon the kind of attention necessary to make these operations a success. Liquid foods and laxatives are resorted to to keep the stool soft to prevent injury, but are rarely effective, as the stool usually gets solid enough sometime during convalescence to tear out the stitches.

After giving this subject much thought, I was directed to the case described above in my own mare, where the external opening and the sphincter ani were united by granulation without suturing; I began to wonder why it occurred in this case and did not in a complete recto-vaginal fissure. After some consideration of the case, I determined that the difference resulted from the fact that in one case, granulation had a base from which to extend upward to close the opening and reunite the sphincter ani, while in the recto-vaginal fissure there is no tissue from which granulation can spring except the anal and vaginal membrane, and these are too delicate and thin to furnish a staple point for granulations to extend to close the opening, hence the scar tissue soon unites the vaginal and rectal membranes on each side and a permanent fissure is established. Reasoning from this I determined the sphincter ani would unite at any point at which it might be severed, providing the outer end of the incision was located in solid tissue. I then determined upon a plan of procedure that would relieve the strain upon the stitches. This I accomplished very nicely by simply dividing the sphincter ani superiorily, cutting from the anus upward to the under surface of the tail. By examining the anal re-

gion, one will notice there is quite a cul-de-sac at the upper posterior end of the anus which is obliterated by relaxation of the sphincter ani during defecation.

By actual measurement of a fairly good sized mare, it is found that the distance from the under surface of the tail to the anal opening when the anus is closed is about two inches. When this tissue is divided, it takes away all tension of the sphincter ani and allows the feces to be crowded back and discharged from the anus by peristalsis without any effort on the part of the animal, in fact it prevents the possibility of accumulations in the rectum. This fact can easily be noted in the ordinary case of recto-vaginal fissure; where in place of being passed normally, the feces come away a little at a time and entirely involuntarily.

Mode of Operation: Anesthesia is of very great importance in this operation, because any irritation to these parts causes the animal to strain violently, forcing foreign matter into the field of operation and in other ways seriously interfering with proper suturing of the parts.

After the rectum is thoroughly cleaned, the animal should be completely anesthetized and placed in position, preferably on a table, so the operator can have good light upon the field of operation and with as clean surroundings as possible.

First Step: Everything having been thoroughly cleansed and sterilized, the superior wall of the anus is divided up to the under surface of the tail, then the region is dilated, either by the use of two pair of tumor forceps, one on either side to grasp the tissues midway between the two angles of the opening, so two assistants can pull the tissues apart and pull the torn mucous membranes backward to make suturing easy. In the absence of the forceps, a heavy needle armed with a strong tape may be inserted through the margin of the wound midway between the tail and the inferior commissure of the vulva on each side and the ends of each tape firmly tied. These guys furnish a splendid hand hold for assistants to enlarge the opening as far as possible, which furnishes abundance of room for further operative procedure.

Second Step: This will depend upon the time at which this operation is performed. If the wound has been recently made, no scar tissue has formed, then the parts are ready for suture and should be brought together by strong suture material, usually best applied by passing the needle from the rectum some little distance

to one side of the margin of the wound, downward through the peri-rectal and vaginal tissues, getting as firm a hold as possible until the needle reaches the vagina, then it is carried across to the opposite side and passed upward in like manner to the rectum, then the two ends tied holding the tissues in firm contact. The suturing must begin at the center. One uninterrupted suture after another is applied in this manner from before backward fairly close together until the perineum is reached, which is united in like manner, as well as the sphincter ani. If one prefers, these sutures may be reversed by passing the needle upward from the vagina to the rectum, then downward again on the opposite side placing the knot in the vagina rather than in the rectum. This has the advantage of leaving a smoother surface in the rectum, which facilitates cleaning of that organ.

If the wound has cicatrized, then a far different procedure is necessary. We must first remove all the scar tissue; this should be done with a sharp scalpel, cutting along the margin of the cicatricial tissue and vaginal membrane, then along the margin of the cicatricial tissue and rectal membrane from side to side so as to completely sever these membranes from the scar tissue, which is removed. It is well to dissect back between the mucous membrane both above and below until the normal connective tissue is found, thus removing all organized connective tissue which develops during the cicatrizing process. When this is carefully removed, the tissues are ready for suturing. This may be done by beginning at the anterior end of the fissure in the median line and the mucous membrane of the rectum first brought together either by uninterrupted or continuous sutures back to the perineum, then the vaginal membrane is similarly treated and the operation is completed by carefully suturing the perineum and sphincter ani from the anal opening to the superior commissure of the vulva. This tissue should be stretched from above to below, so as to elongate them during the suturing process, or the parts may be held together by a simple row of interrupted sutures as described for the subject where cicitrization has not occurred, but in either case, care must be taken that the under surface of the mucous membrane is brought in contact with its fellow from the opposite side in order that union may occur with the least possible loss of time.

Strong linen or silk suture may be used for this purpose or absorbing catgut. If the latter is used, not less than 20 day cat-

gut should be depended upon. Catgut has the advantage of absorbing and the stitches do not have to be removed.

The after treatment consists in keeping the parts thoroughly clean by a liberal use of sterile water and after each irrigation an application of a little tincture of iodine, first in the tincture then later diluted to 25% or 50% of its full strength, the object being to keep the surface dry and prevent suture abscess formation until the wound has healed, then no further treatment will be needed.

The incision through the upper wall of the anus will gradually unite and by the end of four or six months, the sphincter ani will have regained its normal condition and the patient has entirely recovered. The division of the sphincter ani is just as important in treating a recto-vaginal fistula as it is in recto-vaginal fissure, and the operation would consist in first scarcifying the margin of the opening, dissecting apart the cicatrized mucous membranes, then closing the opening by interrupted sutures. The after treatment should be the same as for rectal-vaginal fissure.

The division of the sphincter ani will relieve the strain from the rectum and the chance for healing is fair, yet in human surgery as in our own practice, the treatment of recto-vaginal fistula is always more difficult than that of recto-vaginal fissure.

THE DETECTION OF JOHNE'S DISEASE BY THE USE OF JOHNIN

E. G. Hastings, B. A. Beach, and F. B. Hadley, College of Agriculture, University of Wisconsin. (1)

The disease which is commonly known as Johne's disease has attracted a considerable amount of attention in this country and a number of papers have appeared in regard to the nature of the disease. So far as we are aware, no published statements have appeared concerning the isolation of the organism in this country and the use of extracts of the organism for diagnostic purposes. We have been informed, however, by personal communication that such a culture was isolated by the Bureau of Animal Industry of the U. S. Department of Agriculture. The Bureau, however, was not successful in propagating the same.

In the summer of 1915 tissues were received from a herd which had been afflicted with Johne's disease for a considerable

(1) Published by the permission of the Director of the Experiment Station.

term of years. Cultures were made from the wall of the intestine and from the mesenteric lymph nodes onto agar which contained human tubercle bacilli and to which had been added a small amount of sterile blood serum according to the method suggested by Twort and Ingram in their monograph on Johne's disease, published in 1913. Out of a considerable number of tubes that were inoculated, two showed no contamination with rapidly growing saprophytic organisms. Microscopic examination, after a considerable interval, of the two non-contaminated tubes showed such numbers of acid-fast organisms corresponding to the description given by Twort and Ingram that it seemed certain reproduction of the organism in the tissue had occurred. Transfers were made from the original tubes into other tubes containing a similar medium. A very meager growth was obtained. The development of the organism was exceedingly slow. No animal inoculations were made with this culture.

During the past five years Johne's disease has been diagnosed in our laboratories by an examination of material from different herds. In all probability the disease exists in a considerable number of Wiisconsin herds, but remains undiagnosed because it is not suspected or because no reliable diagnostic agent has been available. The bacterioscopic examination of feces and rectal scrapings is valuable in about 40 per cent of chronic cases and in about 20 per cent of all cases. Furthermore, when this method is used care must be taken to differentiate such acid-fast organisms as may be found from those of tuberculosis and non-pathogenic acid-fast bacilli to be found in the intestinal content.

Twort and Ingram prepared a diagnostic agent in a manner comparable to that used in the preparation of tuberculin. It was employed in larger doses than is customary in the case of tuberculin and was injected directly into the circulation rather than subcutaneously.

In September, 1916, an effort was made to prepare some of the diagnostic agent to which Twort and Ingram applied the name "Johnin". A medium was made from fresh meat; 1 per cent of peptone, ½ per cent of potassium acid phosphate, and 5 per cent of glycerine by volume were added and also the growth from a considerable number of acid-fast organisms, the following organisms being used: the smegma bacillus of Moeller, the grass bacillus of Moeller, and the butter bacillus of Rabinowitsch. The suspension of these organisms was heated to 100° Centigrade for two

hours, was then filtered and placed in small Erlenmeyer flasks. Just before inoculation 1 c.c. of naturally sterile blood serum was added to each flask containing 75 c.c. of the medium. These cultures were allowed to incubate until May 1, 1917. The growth was confined entirely to the bottom of the medium and consisted of tiny masses of the acid-fast organisms. No turbidity or surface pellicle was found in any of the flasks. The cultures were concentrated to one-tenth of their original volume and one-half of one per cent of carbolic acid was added as a preservative.

In June, 1917, an opportunity was presented to test a known infected herd with this product. The concentrated extract of the organisms was diluted to the original volume of the cultures with a physiological salt solution. The solution was then filtered through paper.

History of the Herd Tested. The herd has been afflicted with the disease about ten years. Each year one or more animals have shown clinical symptoms. Attempts to stamp out the disease by removal of all animals showing clinical symptoms have been made at different times, but without success. It seems probable that the infection was introduced into the herd by animals purchased from a herd in which the disease was diagnosed by us about seven years ago. The owner was much discouraged concerning the situation and was ready to try anything that promised to aid in the eradication of this insidious disease.

The test was applied by Dr. W. R. Claussen of the office of the State Department of Agriculture. Forty-three animals were tested. Five of the animals were injected subcutaneously, the remainder intravenously. The temperature readings of the five animals that reacted to the test are given in Table I.

TABLE I.

Temperatures of animals showing a thermal reaction to Johnin:

No. of animal	Temperature before injection		Temperature after injection								
			Hours after injection								
			1	2	3	4	5	6	7	8	9
1	0.8*	1.2	1.2	2.2	2.0	2.4	2.4	2.0	2.0	2.0	
2	1.6	1.0	2.1	3.0	3.2	3.4	5.2	4.4	3.6	3.4	3.0
3	0.6	1.2	1.6	3.0	3.3	4.0	4.1	3.8	3.2	3.0	
4	1.3	0.8	1.7	1.5	2.4	1.9	2.5	3.0	3.3	4.4	4.2
5		1.4	2.3	2.7	4.0	3.8	4.0	3.0	2.2		

*First two figures omitted, e. g., 0.8=100.8°F.

Each of the animals listed in the table received 10 c.c. of Johnin intravenously. As is to be noted, animal No. 1 did not give what could be called without question a positive reaction. Her physical condition was such, however, that it was evident she was affected. The four other animals showed marked temperature reactions to the injection. Animal No. 1, two hours after the injection, showed a constitutional reaction marked by violent diarrhea. Animal No. 2 had shown no physical signs of the disease until about sixty days previous to the application of the test. The five animals were slaughtered and a careful autopsy made by Dr. W. R. Claussen. Characteristic lesions of the disease were found in each animal. A laboratory examination demonstrated the presence of acid-fast organisms in the intestinal mucous membranes of four out of the five animals.

So far as we are aware, this is the first time the diagnostic agent recommended by the English authorities has been used in this country. A number of tests have been made with avian tuberculin. The results obtained abroad, however, do not indicate that avian tuberculin can be used with success in the detection of the disease. It is hoped to make a second test on the herd in question within a short time and also to make tests on other herds in the state known to be afflicted with the disease.

As stated previously, the growth of the organism on culture media has always been exceedingly meager. Recently we have obtained a more profuse growth on solid media by taking liquid cultures of the human tubercle bacillus, heating them to 100° Centigrade for two hours, removing the growth by filtration through paper, and adding to the filtrate for each liter 15 grams of agar, 2 grams of beef extract, 5 grams of peptone, 2½ grams of potassium acid phosphate, and 25 c.c. of glycerine. The reaction was corrected to + 1½ per cent. Sterile blood serum was added to this medium just before inoculation. The growth on this medium has been more rapid and profuse than on the media previously used. It is, of course, evidently impossible to employ such a medium in the preparation of a diagnostic agent since the active principle of the tubercle bacillus would probably remain in the cultures and would interfere with the test in case any of the animals examined were tubercular. In order to avoid this source of trouble, we are attempting to use broth cultures of various acid-fast organisms and after a considerable period of incubation add-

ing a further supply of nutrient material as was done with the cultures of the tubercle bacillus.

As previously stated, no animal inoculations have been made with this culture and our belief in its identity is based upon its cultural and morphologic characteristics and upon the results which have been obtained in the examination of the herd in question.

A PECULIAR CASE*

W. B. Switzer, Oswego, N. Y.

On the 23rd day of August I received a call from Mr. David Howard to attend a horse at his place in the country nine miles from my office. The owner told me, in my conversation with him over the telephone, that the horse did not appear to be sick but that he could not eat, could not use his jaws. I at once became suspicious that I had a case of tetanus to deal with and went prepared for that contingency.

Upon my arrival at the farm, I found a fine, seven-year-old, bay gelding, apparently in the pink of condition. As he stood on the floor where there was nothing that he could attempt to eat, one could not discover that he had an ailment of any sort. When we offered him something to eat it was utterly impossible for him to take it, though he seemed very hungry.

I proceeded to make an examination and found the temperature normal, the pulse a little accelerated but strong, and, after a time, what seemed to be a very little soreness in the region of the temporo-maxillary joint. Having my mouth speculum with me, I managed to get the mouth open enough so that I could examine the mouth and throat thoroughly, but I found nothing abnormal.

The case puzzled me and I told the owner that I did not know what it was and asked him if the horse had been in any mix-up where he could have been injured. He replied that he knew of nothing of that nature; that the horse was perfectly well when he fed him the night before and that he ate up all of his hay during the night.

I told him that all we could do was to treat the symptoms we

*Read before the Central New York Veterinary Medical Association, Syracuse, N. Y., Nov. 28, 1917.

had found, which was the slight soreness in the region of the temporo-maxillary joint. Leaving a mild liniment, I asked him to keep me advised as to developments.

I was called again on August 25th and found the former symptoms or lesions much more pronounced. The soreness before mentioned was very marked. The muscles of that region as well as the masseter muscles were sore and considerably swollen. The temperature at this time was 104° Fahr. The animal was very hungry and extremely gaunt. I prescribed a febrifuge, with iodide of potassium, and white liniment for external use.

On August 28th, the patient, to all appearances, was improving slightly, except that the fatty cushions above the eyes were very much swollen. The temperature was 102.2°. The horse was bright and eating a very little.

I found him very much improved on Sept. 1st. A second examination of the mouth revealed nothing abnormal. He was eating fairly well and had a temperature near normal. I found that he did not want the curry comb applied to his left side at all and the owner said that he had shown the same aversion to that some days before he was first taken.

On September 5th I received a hurried call and found the horse in an excited condition, dripping with sweat, restless to the extent that it was impossible to keep him quiet for a minute, constantly stepping and showing a marked inability to use the left hind leg, with incoordination of the muscles and weakness. So apparent was this last mentioned condition that Mr. Howard thought he must have hurt himself during the night. He said he considered the animal well when he went to bed the night before and was intending to call at my office when he came to the city on the 5th to inform me that the patient was all right. I gave sedatives and in a few hours they telephoned me that the horse was much improved, was quiet, eating good, but could not use the left hind leg very well.

I saw the horse again on September 8th and, while he was somewhat improved, the case was of such a peculiar nature that I suggested that some one else be called. The owner felt that the case was so nearly hopeless that he would not go to the additional expense.

From that time on he seemed to improve a very little, eating as much as a horse at work, yet constantly losing flesh so that in

the place of the fat, sleek horse he had been when taken ill, he was reduced to a mere skeleton with hide covering. About the 22nd of September, Dr. C. R. Guile of Canton was visiting me and I took him out to see the horse. It was his opinion that the whole trouble originated from some injury in the stall after the first attack, whereby the spinal cord was affected. The indication at this time was that he would eventually recover.

The next that I heard was that he was down and could not get up. On examination, I concluded that to attempt to get him up would in no way improve matters, so he was given a good bed on a large barn floor. I had him turned twice a day and continued to treat him, using, principally, iron, arsenic, strychnine and iodide of potassium, shifting from one to the other as the case seemed to require, and adding such other remedies as acute symptoms suggested.

Nothing seemed to do any good and, though he ate well, he continued to go down in flesh, and on October 8th I was called to put him out of his misery. Upon my arrival at the farm, I found that the horse had been having a coughing spell after they called me and, evidently, had broken an abscess somewhere in the posterior part of the head or throat and seemed much relieved. In fact, he came very near rising to his feet and Mr. Howard thought he would like to give him one more chance.

On the 13th of October he called me up and told me I had better go out and see what I thought of him. At this time the patient was suffering terribly, so I chloroformed and posted him.

The only lesions I could find were an ulcerated condition at the floor of the maxillary sinus, extending to the base of the soft palate, where the abscess which had gathered and broken when he had the coughing spell had apparently been located; also a small abscess at the base of the brain, the medulla oblongata, from one side nearly to the center, being softened nearly to the consistency of pus.

—Dr. J. E. Morse, formerly of Toronto, is now located at Peterboro, Ontario.

—Veterinary Inspector R. C. Surface has been transferred from Greenwood to Ashdown, Ark.

—Dr. F. T. Kocher has recently given up his practice to accept a position with the Gilliland Laboratories at Marietta, Pa.

ABSTRACTS FROM RECENT LITERATURE

OBSTRUCTION OF THE ILEUM BY A TUMOR. E. W. Hoare, F.R.C.V.S. *Veterinary News.*—A well bred 10-year-old mare had always been healthy, but one morning had colicky pains. Taken to the infirmary, besides the abdominal manifestations, her pulse was weak, breathing accelerated, no tympany and no distention of the abdominal walls. A well marked icteric taint of the mucosa and of the eye was noticed. Enemata were not retained and hard feces followed their administration. Little relief by treatment was obtained and no change observed except a greater injection of the mucosa. The temperature went up to 104°F. Finally death occurred. Post mortem—No tympany of the bowels. Stomach much distended. Tissues icteric. Small intestines distended. About 8 feet from the termination of the ileum there was a tumor-like growth in the intestinal wall and cutting into this it gave the appearance of a huge ulcer which occluded to a great extent the lumen of the intestine. In the intestinal wall there was a distinct tumor, of a fleshy nature, which unfortunately could not be examined with the microscope. The liver was pale, small and marked by cirrhosis. The right lung was congested.

The author concludes his record, after a few words on the diagnosis, with valuable remarks on the importance of autopsies which "teach far more than the ordinary treatment of cases."

A. L.

ANTHRAX SIMULATING CEREBROSPINAL FEVER. R. J. Reece. *Lancet*, Vol. 192, p. 406, 1917. *Abst. in The Review of Bacteriology*, etc. Vol. VII, Part 2, 1912, p. 41.—A series of five cases, believed primarily to be cerebrospinal fever, but subsequently proved to be acute anthrax, is reported. It is stated that the bacteriological evidence of the nature of the cases was definite. In all cases anthrax bacilli were cultivated from the cerebrospinal fluid as well as from the blood and tissues. The source of the infection was not discovered with certainty in any of the cases; though in one case the shaving brush appeared to be incriminated, and in a second a similar source was suspected. REICHEL.

AN UNUSUAL CASE OF AZOTURIA. E. W. Hoare, F.R.C.V.S. *Veterinary News.*—This four-year-old farm mare had been left idle in the stable for three days, receiving her usual food. When

she was put to work she became disinclined to go and was forced to trot only by the free use of the whip. She then became very stiff in both fore legs, she sweated profusely and the muscles in the vicinity of the elbow were hard and swollen. When she was examined, the caput muscles of each side were much swollen, hard, prominent and resembled the condition of the gluteal muscles in azoturia. Suspicion of this disease was confirmed by the examination of the urine, an enormous amount of it was removed with the catheter. It was the color of port wine. The animal was put on immediate treatment of sweet spirits of nitre, one pint of linseed oil, fomentations of hot water on the affected muscles and full doses of bicarbonate of soda in the drinking water. Improvement, the next day, was followed by the removal of the mare to her home without the development of further symptoms. A. L.

Camphor in Tetanus. W. Collinson. *Veterinary Record.*—This article records four cases of tetanus treated with intravenous injections of camphorated ether 5-10-15 c.c. and hypodermically by 50 and 70 c.c.

The four animals recovered. In one case much swelling took place at the point of injection which the author attributes to the fact that he had then used unsterilized camphorated oil. One of the cases also manifested marked acceleration of breathing with 5 c.c. of the intravenous injection, but this did not recur when the injection was made slowly. Chloral hydrate was also given to keep the animals quiet. A. L.

An Interesting Parasite.—In some parts of northern South America and particularly in the interior of Colombia, cattle suffer severely from a larval parasite similar to the ox bot fly. This condition, commonly called in Colombia "*Nuche*" (neck) or "*Gusano*" (worm), is due to the presence of the larval form of a fly (*Dermatobia*) beneath the skin. These parasites are so numerous in some sections that cattle raising cannot be carried on, although other conditions are favorable. In other sections it is impossible to raise other than certain native varieties of cattle that possess a considerable immunity to this parasite. These partially immune cattle have short, compact, white hair and a black skin.

Very little has been known of the life history or habits of this parasite that causes immense losses to the cattle industry of these regions, although many theories have been offered.

In the October number of the *Revista Nacional de Agricultura,* published by the Agricultural Society of Colombia, is an excellent monograph on the "Nuche" (*Dermatobia*) dealing particularly with its life history by Sr. E. G. Corradine, who has done a large amount of research work on the subject for which he was awarded a premium by the Agricultural Society of Colombia. In this monograph Sr. Corradine shows that the adult female *Dermatobia* does not deposit her eggs upon cattle but upon the abdomen of other blood sucking flies, where they incubate. When the sucking flies attack animals the minute larvae emerge from the egg, penetrate the skin of the host and develope into adult larvae. During their development they cause intense inflammation of the skin and the formation of abscesses. When fully developed, the larva escapes, falls to the ground and pupates similarly to the common ox bot fly, and finally hatches into the adult fly.

Sr. Corradine states that one adult nuche fly in two days deposited 700 eggs on the abdomens of 20 other flies in captivity.

Sr. Corradine is to be congratulated on the excellent research work done, and it is to be hoped that as a result of his investigations some means will be developed to combat this pest that has proven so disastrous to the cattle industry in some tropical regions.

N. S. MAYO.

FRACTURED PASTERNS. E. Jones, M.R.C.V.S. *Veterinary News.*—Referring to a publication made previously on "hopeless cases", the author relates that of a seven-year-old African bred polo pony which, while in a game, became dead lame on the near hind leg. A diagnosis of comminuted fracture of the coronet was made but the animal was not destroyed. He was treated, a bandage and plaster of Paris splints were firmly applied in which the foot was included and every thing was made for the comfort of the horse, which was a favorite of its owner. The animal was kept for seven weeks in slings when he was gradually allowed the use of his leg. At first he went lame but improved with time until finally the lameness nearly disappeared. Neurotomy was performed with the result that lameness remained slight only when the horse was cold coming out of the stable for exercise or after a period of resting. He, however, resumed his regular work at the polo ground until, in another accident, he fractured nis hip and was destroyed.

A. L.

THE TREATMENT OF FOUNDER (LAMINITIS). Chief Veterinarian Hinniger. *Berliner Tierärtzl. Wochenschrift,* 1917, p. 197. Abst. by Wyssmann in *Schweizer Archiv für Tierheilkunde,* July, 1917.—The author mentions the excellent action of tallianine in this affection and since this drug can no longer be obtained, he sought another method of treatment. Assuming that the cause of founder lies in an oversaturation of the blood with products of metabolism, Hinniger practiced the usual bleeding and then introduced 1 liter of a 2% sodium bicarbonate solution into the jugular vein. The results should be considered very good, since 21 horses, some of which were very severely ill, made a complete recovery in from 1 to 24 hours. L. T. GILTNER.

EPSOM SALTS. W. R. Davis. *Veterinary Record.*—A cow which had calved two days previously had not cleaned. She was much distressed, had painful breathing, high temperature, fast pulse and abnormal sounds on both sides of the chest. She had had a cleansing drench consisting of salts and gentian. She died with traumatic pneumonia due to the drench going the wrong way.

Another cow was suffering with constipation. Two drenches, each containing one pound of Epsom salts, had been given. On palpating the left flank a mass of solid ingesta could be made out. The cow was unable to rise, had a subnormal temperature, rapid pulse, cold extremities. She died the next day.

These two cases are recorded to add to those where the danger of the routine treatment by doses of Epsom salts to cattle have been observed. A. L.

AN EXTENSIVE WOUND. W. Cureton, M.R.C.V.S. *Veterinary Record.*—A four-year-old mare was turned out in a field with three other colts. They became frightened at something, started running and in so doing arrived at a gateway on the post of which was an old bent catch projecting. The mare was caught by this catch, which entered in her near side about three inches below the withers and tore open skin and tissues underneath to the hip. While the mare continued to gallop the cut side skin fell down and was kicked at all the time. The mare was finally caught. Sixteen strong tape stitches were applied. In the lower part of the wound a slit was left open and through it tincture of iodine

and water was injected. This treatment of irrigations, twice a day, with lysol, iodine, creolin and perchloride of mercury at 1 per 1000, was carried out. The animal did well, with the exception of a few days when she was feverish, but finally made a complete recovery. A. L.

STAGGERS IN SHEEP IN PATAGONIA.* F. S. Jones, V.M.D., and J. F. Arnold, D.V.M. (From the Department of Animal Pathology of The Rockefeller Institute for Medical Research, Princeton, N. J.) Abst. from *Jour. of Exp. Med.*, Vol. 26, No. 6, Dec. 1, 1917, p. 805-823.—During the past few years a nervous disorder of sheep has become more prevalent throughout portions of Patagonia.

Conclusions. After observations and experimental work both in the field and laboratory, the following conclusions seem justified:

1. Staggers is a non-infectious disorder affecting horses, cattle, and sheep.

2. The disease is characterized by weakness, muscular twitching, irregular movements of the head, stiffness of the limbs, and transient motor paralysis, accompanied with spastic spasms on excitement. There is also a derangement of vision and conjunctivitis.

3. The postmortem lesions are not characteristic.

4. We readily produced the disease by feeding susceptible sheep on a course tuft grass commonly known as coiron or pampa grass (Poa argentina).

5. The time required to produce definite symptoms by feeding the grass varied. Two animals developed typical staggers after two feedings; in another instance a period of 21 days of feeding was required. The average time for the production of unmistakable symptoms in our experiments was 10 days.

6. Many sheep recover from staggers spontaneously. A complete change of diet will usually effect a cure within 2 weeks.

7. Older animals that have pastured for long periods on lands where the grass grows become tolerant and are rarely affected with staggers.

*The field expenses of this investigation were borne by a sheep-farming company of London, which has not authorized the publication of its connection with the investigtaion, but which gave every facility for the work on its estancia in Patagonia.

8. The grass is toxic to sheep at all seasons of the year. We fed late winter and early spring grass and grass in flower, and produced staggers in every instance. The young green grass is as toxic as any edible portion of the plant. REICHEL.

INCOMPLETE AND SECONDARY FRACTURE BY SHRAPNEL BALL. J. Hamoir. *Recueil de Med. Veter.*—A case illustrating the possibility of incomplete and subsequently a secondary complete fracture in cases where violent traumatism of a bone is superficially protected, and where only the swelling of the part and the severity of the lameness will suggest the possible appearance of subsequent serious accidents.

A mare had a wound in the middle of the anterior face of the cannon in which the fracture took place on the sixth day after her admission to the infirmary. At the post mortem there was found: "an incomplete and comminuted fracture of the cannon bone with splinters in the medullary tissue and an extensive splint of the bone in the greatest part of the diaphysis, uniting by three sides a large splinter still adherent to the body of the bone and then a complete oblique fracture." A. L.

PURPURA HEMORRHAGICA IN COWS. G. Lissot. *Recueil de Med. Vet.*—The author saw two cases which presented to him as principal symptoms: extensive petechiae on the sclerotic, bloody discharge from the nostrils where clots of blood were dried, bloody diarrhea and clots of blood escaping from the vulva. Among other symptoms there were pale visible mucous membranes, arrest of milk secretion, acceleration of the heart beats, temperature 37.6°. Post mortem revealed: the presence of petechiae everywhere, on the inner face of the skin, in the trachea, and the intestinal mucosa, on the peri and endocardium. The progress of the disease was always rapid and death common. A. L.

THE INFLUENCE OF COAGULATION INHIBITING FACTORS ON OVARIAN HEMORRHAGE. Dr. E. Wyssman, *Schweizer Archiv für Tierheilkunde.* Vol 59, No. 7, July, 1917.—The author advances the idea that cases of fatal bleeding following the operation of crushing ovarian cysts or expressing corpora lutea may be explained on the ground that the affected animals may be suffering from certain diseases, notably pulmonary tuberculosis, distoma-

tosis of the liver and possibly pyometra in which there are important pathological changes in the blood picture, as well as a low coagulation valence. A number of instances of ovarian hemorrhage is cited in which the autopsies revealed the presence of one of the above mentioned diseases. He points to the well known fact that in certain cases of tuberculosis and icterus in man the coagulation valence is low and states that there can be no doubt that this is also true of animals. Since the previously known methods for determining the capacity of the blood for coagulation have been rather complicated, little, if any, attention has been given this important subject by the veterinary profession. Now recently, however, the method described by Fonio and Schulsinger which is based on the behavior of the blood drawn from the vessels when mixed with a coagulation inhibiting substance (magnesium sulphate) gives promise of being made to serve the purpose of veterinary medicine and the author believes that the use of this method may lead to a solution of the question of ovarian hemorrhage which up to the present time cannot be regarded as explained. L. T. GILTNER.

DISLOCATION OF THE MAXILLARY SYMPHYSIS IN A COLT. Major Boissiere. *Bull. Societe Centrale.*—A yearling got his lower jaw caught in the teeth of a raking machine and when examined presented the following condition: in the mouth the lesions were serious. The lower nippers were apart two centimeters. The gums were badly bruised and torn in several strips. Both branches of the maxillary bone could be moved. The chin was swollen; saliva flowed bloody from the mouth. There was back of the chin a wound, between the two branches of the lower maxillary. The mouth remained partly open.

After cleansing the parts and removing the torn soft tissues, the branches of the bone were brought together and held by wire passing round the arch of the teeth, notched with a file. For several days the animal had difficulty in drinking, but after a short time consolidation of the two pieces of bone took place and feeding improved. After three weeks, the animal could safely take solid food. A. L.

OLD DIAPHRAGMATIC HERNIA IN A HORSE. Mr. Bouchet, 4th year student. *Bull. Soc. Cent.*—The subject died in the night and the post mortem was made the next morning. The external ap-

pearance was good. The horse was fat. The anterior quarter was congested. The abdominal cavity presented no abnormal condition, the organs were rather anemic. Lungs were engorged with dark blood badly clotted and having the character of asphyxia. The diaphragm showed two lacerations, one recent and one old. The former measured 18-20 centimeters in length; its edges were ecchymotic and thready. It occupied the aponeurotic portion of the left lobe. The abdominal organs had passed into the thorax and pressed on the lungs. The other laceration was much smaller at the limit of the muscular portion of the right lobe, it was narrow, ovoid and its borders formed a thick fibrous ring. A small piece of omentum had passed through it. It was strangulated and the seat of passive congestion. The diaphragm and omentum were adherent and the diapragmatic opening was completely closed. There was also an old fracture of the 5th and 6th ribs. The death was due to the large laceration of the left lobe of the diaphragm and the sudden pressure of the digestive organs upon the lungs. A. L.

REPORT OF THE CHIEF VETERINARY OFFICER, STEWART STOCKMAN, SECRETARY OF THE BOARD OF AGRICULTURE AND FISHERIES, LONDON, FOR THE YEAR 1916.—Foot and mouth disease appeared during the year at the County Asylum Farm, Shepton Mallet, Wells, Somerset. The origin of the outbreak, which did not spread, was not established. Only a few cattle and pigs became infected.

There was an increase of 337 outbreaks of swine fever, as compared with 1915. Thorough inspection was made of all reported outbreaks. Serum treatment was used to a great extent with an encouraging result. The important plan of obtaining a method for the suitable application of vaccination is engaging attention.

There were 44 outbreaks of glanders, a decrease of 4. 832 horses were on the infected premises. 137 were affected.

There was considerable anthrax during the year. 689 animals were involved. Six human beings were affected. There was an increase of 155 outbreaks of sheep scab. The largest increase was in Scotland. 1,467,240 c.c. of swine fever serum were distributed during the year. 8,309 doses of anti-abortion vaccine were issued. HAYDEN.

THE ATTITUDE OF THE MEDICAL PROFESSION TOWARDS CERTIFIED MILK. E. C. Fleischner, M.D. *Proceedings of the American Association of Medical Milk Commissions.*—Most medical men believe themselves more or less familiar with the requirements for the production of certified milk. They neglect the milk supply of their patients until the patients are confined to bed. Then a large proportion recommend pure milk. Over 90 per cent recommend certified milk for infants. Very few say anything about its use by healthy adults. A very large per cent recommend it during illness.

Certified milk has a direct bearing on tuberculosis in milk fed infants. In 150 cases of the disease occurring in infants in the practice of over 500 men, 15% were being fed on certified milk, 85% were being fed only on pasteurized milk.

Over 50% of the medical men living in the area over which the investigation extended use certified milk in their own homes.

A large proportion of the men questioned did not know the source of the milk supply to the hospitals to which they sent their patients. They did not know whether the milk supply of the hospitals was investigated by the management or not. The medical man is not sufficiently acquainted with the methods of producing certified milk. HAYDEN.

SODA LYE NO REMEDY FOR HOG WORMS. Claims for this product branded as false by the Government's Investigators. Soda lye has no value as a remedy or preventive against worms infesting hogs, nor is it likely to be of value against similar intestinal parasites in other animals, according to the United States Department of Agriculture.

Hogs were fed daily with the soda lye mixed in their food in accordance with the directions printed on the label of the sample tested. As a result it was found that the hogs remained infested throughout the period of treatment—2½ months—and that the extent of infestation was increased rather than decreased.

While the efficacy of soda lye against worms parasitic in other animals was not tested, it is probable, says the Department, that it has no value. The digestive tract of sheep is much more complex than that of hogs, and it is probable that a drug having no apparent effect on worms in the comparatively simple digestive tract of hogs would be equally unsatisfactory in the case of sheep and other ruminants.

ARMY VETERINARY SERVICE

THE ARMY VETERINARY CORPS

By the Act of Congress approved June 3, 1916, the Veterinary Corps was placed in the Medical Department of the United States Army. Up to the time of the present war this service was not organized and no enlisted personnel was authorized. Under the Act of Congress approved May 18. 1917, a special order was issued by the Secretary of War authorizing the organization, for the period of the existing emergency, of a Veterinary Corps, National Army, which should consist of 1 commissioned officer and 16 enlisted men for each 400 animals in service. The proportion of animals to men in war is about 1 to 4. One good horse or mule is capable of doing practically as much work as four men. Animals are afflicted with many diseases that are common to man and some of them communicable to man. Statistics show that about 10% of the animals in the Army are constantly incapacitated. In former times this percentage has been much higher and the unfit animals were carried along with those that were working. This plan necessarily interfered with the mobility of an army. Much better results have been obtained by sending unfit animals back of the lines for treatment, where supplies and trained assistance are provided. Under the old plan it was possible to cure only about 60% of those incapacitated, while under the more modern methods practically 90% are cured and become more useful than green horses that are purchased for the army service.

The Veterinary Service in the United States Army is comparatively a new organization. In our civil war most of this work was done by a chief farrier or the chief blacksmith. In March, 1863 Congress passed an act abolishing these positions and provided one veterinary surgeon for each regiment of cavalry. President Lincoln evidently appreciated the value of veterinary service to the army. He offered to some of the best veterinarians in the civil war the subaltern rank of lieutenant. They believed that they should have the rank of captain and unfortunately declined the rank offered. It is believed now that they should have accepted the rank, demonstrated their ability and made their service a necessity.

In later years veterinary schools were organized and decided

progress has been made in preventing and treating the diseases of animals. At the present time there are a number of state schools all of which require a preliminary education of at least four years high school and a professional course of four years. These schools are now turning out men who are well trained in the diseases of animals, animal hygiene, and meat and milk inspection. With the necessary organization and direction it should be possible to utilize these men in building up a veterinary service for the Army that will be a credit to the government. It is unfortunate that the work of organizing this service could not have been completed in times of peace. Under present conditions it has required a great deal of extra effort on the part of the War Department and the Surgeon General to provide for the service.

Up to the time of the present war the veterinary service was unorganized. There was no system of keeping records or directing the service. Fortunately, there were among the few men in the regular veterinary service of the Army some who had served long and faithfully in the Army and had kept informed of the progress made in veterinary medicine in general, and especially in that part which pertained to Army Veterinary Service. The Surgeon General ordered three of these men together with a few veterinarians from civil life to come to Washington to assist in organizing the veterinary service. The following veterinarians have been assisting the Surgeon General in this work for the past three months: Major Gerald E. Griffin, Captain Ray Stanclift, Lieutenant A. L. Mason, David S. White, dean of the Veterinary School, Ohio State University, L. A. Klein, dean of the Veterinary School, University of Pennsylvania, Charles E. Cotton, member of the Minnesota State Livestock Sanitary Board and President of the American Veterinary Medical Association, and C. J. Marshall, State Veterinarian of Pennsylvania.

The plan of organization outlined for the Veterinary Corps is practically the same as that of the Medical Corps. Provisions are made for advance and base veterinary hospitals, veterinary service in connection with the purchase and transportation of animals at posts, in camps, on the march, embarkation depots and on transports. The veterinary officer in charge of the administration of the Veterinary Corps is under the Surgeon General. Other veterinary officers in charge of corps, divisions, brigades, posts, detachments, regiments, etc., have the same relative titles as those of the

Medical Corps and stand in the same relative position to the Surgeon General.

The work of organizing the veterinary service is practically completed. It is hoped that good results will be obtained. The service will be useful to the Army and Animal Husbandry in general, and will encourage schools to extend or maintain the high standards which some, but not all, have already adopted.

A COMPLIMENT TO THE VETERINARY PROFESSION. The chief of staff of the 41st Division, National Army, has appointed Maj. L. A. Merillat, Division Veterinarian, Lieut. H. K. Steckel, V.C., and Capt. J. C. Exline, 146 Field Artillery, as a board of officers to attend to all matters pertaining to the meat supply of the division.

Capt. Exline, although not a veterinary officer, is a veterinarian well known in the west, having served in the capacity of Inspector in charge of the Bureau forces at Walla Walla, Washington. He is a very efficient executive and line officer and was selected to serve on this board because of his knowledge of meat inspection.

Lieut. Steckel is one of the Veterinary Reserve officers who took special instructions in meat inspection under Capt. Lytle, V.C., in Chicago before being assigned to duty in this division.

—Major Griffin is on temporary leave of absence at the Walter Reed Military Hospital, Washington, D. C., for treatment for hip trouble. It is expected he will be assigned to duty shortly.

—Lieutenant Colonel Miller of the Medical Corps is Acting Director of the Army Veterinary Service.

—Lieutenant Colonel Aitken of the British service is assisting in the veterinary organization.

—Majors Turner, Cotton and Staley are making an inspection of the various cantonments and Auxiliary Remount Depots through the country. A need for better organized and more efficient service is shown.

—Majors L. A. Klein and A. L. Mason are in France.

—A competitive examination was conducted recently in the various camps for veterinarians who are eligible for advancement to higher grades.

—Lieutenant Philip H. Fulstow, formerly of Sparta, Wis., is now stationed with the 122d Field Artillery, 33d Division, Camp Logan, Houston, Texas.

—Lieutenant Hurst M. Cameron, formerly of Springville, Ia., is now with the 23d Engineers, Camp Meade, Md.

—Lieutenant W. K. Herbott, formerly of Chicago, Ill., is now stationed with the 77th Field Artillery, Camp Shelby, Miss.

—Lieutenant H. E. Torgersen, formerly of Oakland, Cal., is now Post Veterinarian at Fort Douglas, Utah.

—Dr. J. M. Twitchell, formerly of Center, Colo., is now stationed with the Auxiliary Remount Depot No. 323 at Camp Funston, Kans.

—Lieutenant I. G. Howe has been transferred from Gettysburg, Pa. to the 61st U. S. Infantry, Camp Greene, Charlotte, N. C.

—F. I. Pogoda has been transferred from Fort Sheridan, Ill., to Troop B., 5th Cavalry, Fort Bliss, Tex.

—Dr. P. E. Johnson, formerly of Pierre, So. Dak., has received a commission as Second Lieutenant. He will continue his state work and practice at Sioux Falls until called to the service.

—Dr. G. R. Schaffer has removed from Midland to Detroit, Mich. Dr. Schaffer has accepted a commission in the Veterinary Reserve Corps of the Army.

—The Trend of Prices. The price of meat animals—hogs, cattle, sheep and chickens—to producers of the United States increased 8.1% from August 15 to September 15; in the last seven years prices increased in like periods 1.4%. On September 15 the index figure of prices for these meat animals was about 52.7% higher than a year ago, 88.9% higher than two years ago, and 81.2% higher than the average of the last seven years on September 15.

—Dr. M. E. Dennington has removed from Cortland to Tully, N. Y.

—Dr. D. B. Pellette has removed from Talladega to Oxford, Ala.

—Dr. W. R. O'Neal has removed from Pomona to Newman, Calif.

—Dr. H. L. Darby has removed from Little Rock, Ark., to Fort Worth, Texas.

ASSOCIATION MEETINGS

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION

The eighth semi-annual meeting of the Central New York Veterinary Medical Association was held in Syracuse on November 28th, 1917.

The morning session, beginning at 9:30, consisted of a clinic held at the infirmary of Dr. H. A. Turner in South Salina Street. The operations performed included subjects having fistula, quittor, and enlargement of the penis; also a roarer.

During the progress of the clinic a substantial lunch was served at the infirmary.

The business session convened at 2:00 o'clock at the St. Cloud Hotel, with the president, W. M. Pendergast, in the chair. The following members were present: H. A. Turner, F. E. York, E. E. Dooling, Wilson Huff, W. M. Pendergast, M. W. Sullivan, A. L. Danforth, J. H. Stack, W. B. Switzer, J. A. Pendergast, W. L. Clark, C. R. Baldwin, J. K. Bosshart, D. O'Loughlin, O. P. Jones and A. J. Tuxill. The Association had as its guests: Drs. Leroy and Carr R. Webber of Rochester, Dr. D. D. LeFevre of Newark and Dr. J. W. Turner of Lyons.

The matter of a fund for the relief of veterinarians (and their families) in the allied armies, being raised by the American Veterinary Medical Association, was presented in a letter from Dr. P. A. Fish. The support of the Central New York Association was promptly pledged, each member present handing the Treasurer $2.00 and the Secretary being instructed to solicit subscriptions from the absent members.

The president, Dr. W. M. Pendergast, in his address, suggested that members called to the colors, upon reporting such fact to the Association, should be afforded all aid possible at the hands of the members individually. This suggestion resulted in a full discussion and in hearty commendation of the idea.

Case reports were given by Dr. J. A. Pendergast on the finding of a foreign body in the heart of a cow, Dr. W. B. Switzer on "a peculiar case", Dr. M. W. Sullivan on an operation performed by Dr. Sullivan and Dr. Stack to remove $125.00 from the rumen of a bull, and by Dr. John K. Bosshart on a case of anthrax in the

human resulting from bovine anthrax. These reports were interesting and resulted in general discussion.

Dr. J. H. Stack was duly admitted to membership.

Very interesting and instructive addresses were made by the visitors. W. B. SWITZER, Secretary.

TIPPECANOE VETERINARY MEDICAL ASSOCIATION MEETING

An excellent clinic was held at LaFayette, Indiana, December 12, 1917, followed by a banquet at one of the local hotels, after which Professor H. E. Allen, Associate Professor of Animal Husbandry of Purdue University, gave a masterly talk on Breeds and Breeding. The veterinarians of this section feel fortunate in having a man like Professor Allen who can come before them and discuss such an important phase of the livestock industry.

Thirty-four veterinarians attended this meeting and 23 remained for the banquet and evening session.

Dr. G. H. Roberts, President of Indiana Veterinary College, gave a very interesting talk on bacterial therapy and mixed infection. Other short talks were given by members present.

Dr. H. G. White of Kokomo and Dr. L. M. Peterson of Otterbein were in charge of the all-day surgical clinic.

The next meeting will be held the second week in February, which will possibly be the last regular meeting until mid-summer, when the annual picnic will be held.

In one year this organization has grown from three to 10 counties, and is one of the most active organizations of its kind in the country. L. C. KIGIN, Secretary and Treasurer.

THE NORTHEASTERN INDIANA VETERINARY MEDICAL ASSOCIATION

The following resolution was passed at the meeting held at Fort Wayne, December 11:

Whereas, the Hon. Herbert C. Hoover, National Food Administrator, has called the attention of the people of the United States to the importance of saving food for the National Army and for our Allies across the sea;

Whereas, our attention has been called by the U. S. Department of Agriculture to the enormous losses in food producing ani-

mals from the various contagious and infectious diseases, and which impresses all at this time of the paramount importance for concerted and efficient endeavor of those best able to serve;

Whereas, the veterinary profession of Indiana is established for the conservation of food producing animals and being especially trained we further offer our services to an increased production of live stock, and believe that our profession should be more generally recognized in the present appeal for food conservation;

With this thought in view, be it resolved that the Northeastern Indiana Veterinary Medical Association extend to the Hon. David F. Houston our earnest support, assuring him that we shall give to his department our best effort in conserving the live stock of the State, by assisting in the control and eradication of diseases and thereby stimulating an increased production, and respectfully request that the veterinary profession be duly recognized in the control and eradication of diseases and production and conservation of live stock.

THE DOMINION VETERINARY MEAT INSPECTORS' ASSOCIATION OF CANADA

I have been instructed to convey some information relative to this Association, which at present is little known to those outside the immediate membership.

As the name indicates, this Association is composed of veterinary surgeons employed under the Dominion of Canada Meat and Canned Foods Act as Meat Inspectors and is for the purpose of improving the efficiency of the service and bettering the condition of the Inspectors generally.

Our Association is comparatively a new one, having only been reorganized during the present year when membership was confined solely to veterinary surgeons.

The membership now numbers nearly one hundred and includes men in all parts of the Dominion.

A large number of our members are also members of the American Veterinary Medical Association and are receiving their Journal regularly.

The executive officers are as follows:

President, D. R. Bone, 900 Bloor Street West, Toronto; Vice-President, Wm. Bright, Toronto; Secretary-Treasurer, T. E. H. Fisher, 64 Mavety Street, Toronto.

Executive: D. C. Tennent, Toronto, Ontario; Wm. Tennent, Toronto, Ontario; T. M. Pine, Toronto, Ontario; C. J. Johannes, Hamilton, Ontario; W. R. Wood, Montreal, Quebec.

Our Association meetings are held the 3rd Saturday of every month in Occident Hall, corner of Queen and Bathurst Streets. Toronto.

T. E. H. FISHER, Secretary.

WESTERN NEW YORK VETERINARY MEDICAL ASSOCIATION

The meeting was called to order at 2 P. M. at the S. P. C. A. Hospital where we held clinics. We had cases of roaring, sarcoma of the turbinated bones of the nose, a case of digital neurectomy, fistula of the spinous process of the scapula, a case of biliary colic, a case of paralysis in a dog and demonstrations of the stomach tube and raising a horse with a rope.

After the clinic we had a business meeting at which the question of formulating a uniform scale of prices was well debated and a committee appointed to decide upon a uniform scale and present at our next meeting.

Two applicants were elected to membership. We had a good attendance and one of the best meetings we have ever had in every way.

Our banquet at 6:30 was at the Hof-brau at which Dr. J. G. Wills, Chief Veterinarian of the State, gave us a very interesting talk on veterinary legislation.

After the banquet we had our papers, which were very interesting and instructive. Dr. Moore, who was to be with us, did not arrive until 10:30 P. M., but every member was waiting for him and he addressed the Association on the war question, which was of unusual interest to every member, especially at this time as so many of us know practically nothing about the army veterinarians.

We had Dr. H. S. Beebe of Albion and Dr. J. G. Wills, Albany, as visitors. Dr. Moore and Dr. Wills were elected to honorary membership. Our next meeting will be held the last week in June, 1918.

F. F. FEHR, Secretary.

KEYSTONE VETERINARY MEDICAL ASSOCIATION

The regular monthly meeting of the Keystone Veterinary Medical Association was held on Tuesday evening, December 11th, 1917, at 8:30 P. M., at the Chamber of Commerce, Widener Building.

The meeting was called to order by the President. There was a good attendance.

The program for the evening was as follows:

Dr. Alexander Glass gave a very interesting talk on "Some Observations on Mild and Acute Nephritis in Dogs." This brought forth considerable discussion by a number of the members. Dr. Crocker said that he had found on post mortem that nearly all dogs and puppies over three weeks old showed nephritis.

Dr. John W. Adams gave a very interesting talk on "Local and General Anesthesia". He said that he would not advise chloroform to be given a horse that had heaves or the old fat horse; nor does he advise chloroform for the cow or hog. He spoke very favorably of the new anesthetic known as "Alypin". He said he has been using it for the last four or five years with good results.

C. S. ROCKWELL, Secretary.

NINTH ANNUAL CONFERENCE FOR VETERINARIANS, ITHACA, N. Y.

The following program has been arranged:

January 10, 1918.

The Veterinarian and Conservation.....V. A. Moore

Lesions in Spavins and their Significance.....S. A. Goldberg

(Illustrated by lantern slides)

Digestive Action of the Mouth Secretions of the Horse.C. E. Hayden

Garbage Feeding and the Care of Garbage Fed Swine..R. R. Birch

The Work of the Bureau of Animal Industry and the War....

O. U. Houck, Bureau of Animal Industry, Washington, D. C.

RECESS FOR LUNCHEON 12:30 TO 2:00 P. M.

Symposium on Retained Placenta

Treatment of Retained Placenta.....D. H. Udall

Retained Placenta and Its Consequences.....W. L. Williams

Discussion opened by Dr. G. A. Knapp, followed by Drs.

W. G. Hollingworth, P. J. Axtel, J. L. Wilder and others

Work of the State Food Commission.....Pres. J. G. Schurman

Address—Live Stock Production and the Veterinarian.....

Pres. F. Torrance, Veterinary Director-General, Ottawa, Can.

Smoker—Museum, James Law Hall

January 11, 1918.

Tuberculosis of the Generative Organs.....W. L. Williams

The Actual Cautery for Chronic Inflammations of Tendons and Tendon Sheaths of the Leg of the Horse.....
.....John W. Adams, Univ. of Pa.

The Organization of a Veterinary Corps for the National Army
Major David S. White, Surgeon General's Office, Washington

The Economic and Military Necessity of an Army Military Service.....Col. Aitken, Veterinary Adviser from Overseas

Meetings of Alumni Associations will be held in the various rooms in the college, the place of each to be announced.

Luncheon—A light lunch will be served in the Museum of James Law Hall from 12:30 to 2:00 P. M.

Clinics

Surgical.....Surgical Operating Room
J. N. Frost and E. B. Hopper

Small Animal.....Small Animal Hospital
H. J. Milks and W. E. Muldoon

Post Mortem.....Post Mortem Room
W. A. Hagan and S. A. Goldberg

(Subjects for clinics and post mortem to be announced)

6:30—Ithaca Hotel—An informal dinner for those attending the conference

The laboratories and library will be open for the benefit of the visiting veterinarians. The members of the faculty will be glad to give any assistance that they can. The librarian will be present to assist any who wish to use the library.

UNITED STATES LIVE STOCK SANITARY ASSOCIATION

The annual meeting of this association convened at the Hotel LaSalle, Chicago, on Dec. 3, 1917, Dr. J. G. Wills presiding.

The report of Secretary-Treasurer Ward showed the finances of the association to be in a flourishing condition.

The program on "Tuberculosis" was evidently enjoyed by the very large attendance. E. Z. Russell, editor of the *Twentieth Century Farmer*, addressed the association on the subject from a layman's viewpoint. Dr. J. A. Kiernan presented the B. A. I. plan of co-operation. Dr. W. J. Fretz, B. A. I., gave a plan of marking cattle for identification.

The discussion of the papers was participated in by Drs. A. T. Peters and J. A. Anderson; H. R. Smith, Live Stock Commissioner, Chicago; G. W. Tuttle, Manager of the Briarcliff Farms, Pine Plains, N. Y., and others. Much enthusiasm was manifested in the discussion. Mr. Tuttle's experience was of particular interest, covering as it did a considerable period and involving data on many hundreds of animals. It was emphasized that tuberculin should be considered as the best diagnostic aid for tuberculosis in existence but that it should not be considered as infallible or expected to perform impossibilities.

Dr. Ward Giltner presented a very exhaustive report on contagious abortion. Necrobacillosis by Dr. W. L. Boyd brought out a very lively, interesting and instructive discussion.

Owing to Hon. R. A. Pearson having been detained by official business it was impossible for him to appear, which was a disappointment to many who had gathered to hear him.

On Tuesday, December 4, 1917, hog cholera was discussed, Dr. Dorset advising of some experiments by the Bureau as to the various modes of transmission of this disease. It was brought out that from the experiments conducted hog cholera was not carried by birds or on the feet of attendants from pen to pen as readily as had been suspected. Further studies on this important question were being considered. The discussion on this paper was of very great interest.

In the absence of Dr. Reichel, who was unavoidably absent, a brief report of the committee on diseases was given by Dr. Kinsley.

Report of the committee on hog cholera by Dr. Connaway brought forth an extended discussion, the question of whether certificates of health should be required on shipments of hogs interstate being one of the subjects considered.

On Wednesday morning a paper by Dr. G. A. Johnson of Sioux City on black leg and its prevention called forth considerable discussion.

The cleaning and disinfection of stock cars by J. H. Mercer of the National Live Stock Shippers Association followed. Because of Dr. Mercer's long experience the association exhibited great interest and the remarks on the subject were quite extended.

The report of the committee on the accredited herd plan was then received and Dr. Kiernan, as chairman, presented a draft of the plan recommended by the Bureau of Animal Industry, which was adopted. This will be printed and distributed later.

Following the committee reports a business session was held at which the following officers were elected for the ensuing year:

Dr. M. Jacob, Tennessee, President; Dr. A. J. Glover, Wisconsin, Vice-President; Dr. A. S. Cooley, Ohio, Vice-President; Dr. W. F. Crewe, North Dakota, Vice-President; Dr. G. H. Dunphy, Michigan, Vice-President; Dr. F. Torrance, Canada, Vice-President; Dr. S. H. Ward, Minnesota, Secretary-Treasurer; Mrs. J. A. Flaws, Chicago, Ill., Clerical Assistant.

The pleasant feature of the week was the meeting of State Live Stock Officials at the Saddle and Sirloin Club as guests of the Chicago Live Stock Exchange. S. H. WARD, Secretary.

COMMUNICATION

CREDIT WHERE CREDIT BELONGS

To the Editor of The Journal of the A. V. M. A.:

In the September number of your *Journal* there is an article with two pictures of "The New Veterinary Hospital" at Camp Stotsenburg, Pamp, P. I., and signed by two letters, N. S.

FIG. I.

The writer of the present, having been on duty at this hospital since February 4th, 1915, and still here on duty with the 9th Cav-

FIG. II.

FIG. III.

alry, is authority for the facts in the case, denying in toto the statements of N. S. (a fictitious name in my opinion).

When I came to this Post I found Drs. Mitchel and Seely with the 2nd Field Artillery and Dr. Koons and myself were attached to the 7th Cavalry. In August, 1915, Dr. Gould came to replace Dr. Seely and in January, 1916, Dr. Fred B. Gage came to replace Dr. Mitchel. In March, 1916, Dr. Foster came to replace Dr. Koons.

All of the time, until Dr. Gage came, we worked in the old shack and the applications of several veterinarians on duty here, among whom were Drs. Mitchel and Koons, for a new hospital, were repeatedly disapproved. When Dr. Gage came, he, being the

FIG. VI.

senior veterinarian, proposed to the rest of us that he was going to try for a new veterinary hospital and was promptly discouraged by the veterinarians on duty at that time, in making him believe that he could never have it done, due to the repeated failures of other veterinarians to get it.

He set to work thru military channels and with dogged determination and untiring effort he finally succeeded in having his application for a new veterinary hospital approved. He is the one who originally planned the site and the rough plan of the hospital, suggested the construction to Mr. Matsadeiro, the Post engineer, and the final plans were submitted to him for his approval.

He was daily watching its construction and constantly making alterations as to its serviceability, until it was finished.

Right here I want to say that not only did Drs. Gould and Foster not have anything to do with the suggestions as to the construction of the hospital, but have never treated a single case in this building, as they were by Post orders assigned as attending surgeons to the 2nd Field Artillery and 9th Cavalry, respectively,

FIG. V.

while Dr. Gage and myself were assigned to the veterinary hospital, with Dr. Gage, the senior veterinarian of the Post, in charge.

As I feel that this hospital has not been fully described I enclose pictures of the interior to correspond with the exterior pictures recently published.

HENRY L. SOMMER,
Veterinarian 9th U. S. Cavalry.

—The annual meeting of the Pennsylvania State Veterinary Medical Association will be held at Harrisburg, January 22 and 23. An interesting program has been arranged.

—The Northeastern Indiana Veterinary Medical Association will hold its next meeting January 8.

—The Wisconsin Veterinary Medical Association will hold its next meeting January 15, 16, 17, 1918.

REVIEWS

LIVESTOCK ON THE FARM

WILLIAM DIETRICH, B.S.A., M.S.
Head of the Department of Animal and Dairy Husbandry at the University of Minnesota, Crookston Branch. 12 mo. of 269 pages with 68 illustrations. $1.50 net. W. B. Saunders & Co., Philadelphia and London.

The purpose of this volume is to give information to those who wish to improve their condition by means of livestock, to farmers generally, and especially to those interested in livestock farming and inbreeding. It is intended also to serve as a text book in Animal Husbandry in Agricultural Schools, in High Schools and in elementary courses in Colleges of Agriculture.

It is also a book which should interest the veterinarian; for livestock on the farm is fundamentally the reason for the existence of the veterinary profession. During war time, especially, the conservation of the health of the food producing animals is of the highest importance. Our chief dependence for fat and protein food is from animals. Our wool clothing is derived from the same source and animals are essential in conserving the fertility of the soil for the production of our carbohydrate food. The animal factor is therefore indispensable in maintaining the necessities of life and many of the industries of a civilized state.

Aside from the community of interest in animals, the veterinarian has a special interest in protecting them from the ravages of disease. The annual loss in this direction runs high, and as disease is so often associated with unhygienic environment and unsatisfactory dietetic conditions, the veterinarian must be competent to correct these evils.

There is much in this book that will be of value to veterinarians in the matter of feeds and feeding; their service may oftentimes be quite as valuable to the farmer in an advisory as in a therapeutic capacity. Prevention is often more valuable than the cure of disease. To effect this the veterinarian must have a comprehensive knowledge of the conditions relating to animals in addition to the technical details of pathological change.

The book includes thirteen chapters and a satisfactory index. The chapters deal with: Grain Farming; Livestock Farming; Farm Animals; Feeds for Animals; Animal Breeding; Horses; Cattle; the Dairy Cow; Beef Cattle; Sheep; Swine; Poultry and Swine Feeding. The work is well arranged. The paper, typogra-

phy and illustrations are excellent and reflect credit upon the publishers. P. A. F.

A HANDBOOK ON ANTISEPTICS

HENRY DRYSDALE DAKIN, D.Sc., F.I.C., F.R.S.
AND
EDWARD KELLOGG DUNHAM, M.D.
Emeritus Professor of Pathology, University and Bellevue Hospital Medical College; Major, Medical Officers Reserve Corps, U. S. Army. Published by the Macmillan Co., New York. Price $1.25.

The object of this handbook of 129 pages is to present a concise account of the chief chemical antiseptics which have been found useful for surgical purposes during the present war. The contents are grouped under eight chapters: General Introduction; Antiseptics of the Chlorine Group; the Phenolic Group of Antiseptics; Salts of the Heavy Metals in Antiseptics; Dyes as Antiseptics; Miscellaneous Antiseptics; Methods of Testing Antiseptics and Certain Applications of Antiseptics. Each chapter, although presented concisely, brings our knowledge up to date. The frequency and severity of wound infection, in the war zone, has been unparalleled and has led to a considerable advance in our knowledge of antiseptics and methods for their successful employment.

The ideal surgical antiseptic should effect complete sterilization within its sphere of action without causing damage to tissue cells. Although such a substance may not be found, it is surprising to note how little damage may be done to the animal tissues by some of the antiseptics. In wounds treated with the hypochlorites it is quite the usual phenomenon to observe activity of the leucocytes located there. Revolutionary results have been obtained by the use of Dakin's solution and its more recent modifications. Its use is by no means confined to war wounds nor to human surgery. Veterinary journals have recently reported favorably on its application to infections and wounds in animals and its use in this field will undoubtedly be greatly extended. The booklet is timely in its appearance and should have a direct interest not only for the many veterinarians who have entered the service but for the many others who remain in general practice.

The book is of convenient size for the pocket and is provided with a waterproof cover. The publishers have evidently had in mind the needs of the veterinarians as well as surgeons.

P. A. F.

NECROLOGY

ALONZO DORUS MELVIN

The death of Dr. Alonzo D. Melvin, Chief of the Bureau of Animal Industry since 1905, is regretfully announced. Although suffering from a pulmonary weakness for several years, Dr. Melvin fought the affliction cheerfully and heroically and was, in fact, at his desk the day before his death. An impending chill compelled him to leave at that time, and thereafter his condition grew rapidly worse. On the following evening, Dec. 7, he succumbed from pulmonary hemorrhage. The funeral took place at Washington, D. C., on December 10.

Dr. Melvin was born at Sterling, Ill., October 28, 1862, and was given the degree of Doctor of Veterinary Surgery by the Chicago Veterinary College in 1886. His service with the bureau dates back to the year of his graduation, which was almost coincident with the organization of the bureau in 1884. His first work was in connection with the eradication of pleuropneumonia of cattle. In 1890 he was sent to England and stationed at Liverpool to investigate and report upon various phases of the, then, large export trade in live stock from the United States. Upon his return in 1892 he was placed in charge of the Federal meat inspection at Chicago. In 1895 he was transferred to Washington and made Chief of the Inspection Division, which at that time included the quarantine work, the eradication of contagious diseases of animals, etc. In 1899 he was made Assistant Chief of the Bureau, and on December 1, 1905, succeeded the late Dr. Salmon as Chief of the Bureau.

During the twelve years of Dr. Melvin's incumbency as Chief, the work of the Bureau of Animal Industry has expanded very greatly, and the duties of administration have in consequence become increasingly onerous.

The services of Dr. Melvin that perhaps made him best known to the public were in connection with the last two outbreaks of foot-and-mouth disease in 1908 and 1914, both of which were stamped out under his energetic and effective leadership. His services have also been marked by the eradication of the cattle fever tick from 51% of a great extent of southern territory quarantined in 1906. In his term of office the present meat inspection law and similar laws looking to the betterment of the live stock in-

dustry, all of which were advocated by Dr. Melvin, were enacted by Congress.

In addition to his administrative duties he found time to publish a number of important publications on meat inspection, foot-and-mouth disease, bovine tuberculosis, and the South American meat industry.

Outside of his official position, Dr. Melvin was prominent in veterinary and scientific organizations. Among these may be mentioned the American Veterinary Medical Association, of which he was elected president in 1909. He was an honorary associate of the Royal College of Veterinary Surgeons, London, England, and was a member of the advisory board of the Hygienic Laboratory of the United States Public Health Service.

The offices which he held came to him because of the recognition of his eminent fitness for the duties by virtue of his talents, his wide experience, and his devotion to duty. His progress to the highest position in the Bureau was a reward for an unusual accuracy and trustworthiness and a personality as strong and sincere as it was gentle. His long and loyal service was distinguished by his courtesy and fairness in his official dealings and by his uniform kindliness and equability in all his personal relations. With his watchful encouragement, the employees of the Bureau have pursued their varied duties with zeal and have achieved a number of signal and outstanding triumphs. Dr. Melvin was noted for his sterling honesty, integrity and firmness, and in the discharge of his responsibilities he gave his entire strength and his life in unselfish service for others. As a friend he was amiable, true to his associates, and to all his obligations. His absolute frankness, magnanimous generosity and love of justice will keep his memory green forever with all those who have enjoyed the privilege of his friendship.

No more fitting tribute could be paid the memory of the late Chief than is embodied in the resolution adopted at a recent meeting of his colleagues in the Bureau of Animal Industry, from which the following is quoted:

By the death of Dr. Alonzo D. Melvin, the Bureau of Animal Industry suffered the loss of an able administrator and the country a loyal efficient public officer. The remarkable progress of the Bureau during his administration, its achievements in the development and safeguarding of an industry so vitally important to the

welfare of the nation as the live stock industry, the advances made toward a more complete protection of the public health from the menaces of communicable animal diseases, and the important results of scientific research carried on under his direction, altogether form an enduring monument to his memory more impressive than any other to those who can see and understand what has been accomplished through his efforts. The beneficence of his distinguished public service will not cease with his going. Moreover, the example of his unselfish devotion to his work for the good of humanity will continue to serve as an inspiration to those who remain to labor in the same field of endeavor. In a more personal way he will always be affectionately remembered as a large-hearted, patient man, kindly, considerate, appreciative of the work of his subordinates who not only respected and admired him as their chief, but loved him as their friend. J. R. M.

BENJAMIN OTEY MINGE

Dr. Benjamin Otey Minge, Birmingham, Alabama, a member of the American Veterinary Medical Association, died October 26, 1917, after an operation, for the removal of a gangrenous appendix, performed six days previously. Dr. Minge was born February 20, 1879, at Farmsdale, Alabama. He was a graduate of the McKillip Veterinary College of the class of 1907. In 1908, June 27, he was married to Miss Loa Mae Mackeonagle. He was a veterinary inspector in the Bureau of Animal Industry and was elected to the A. V. M. A. in 1917.

Edward F. Koehler, Easton, Pa.

—While at the Kansas City meeting of the A. V. M. A. the alumni of the New York City Veterinary College sent the following cablegram to Dr. Liautard: "May we who owe allegiance to our *Alma Mater* send greetings of loving admiration to the master mind that gave to American Veterinary Medicine its highest ideals; and in this hour of world-wide stress, extend sympathy and a rich guarantee of helpful service."

To Our Dead Chief

By T. P. WHITE, Washington, D. C.

Our Chief is dead!
No more his name shall be affixed
To documents dealing with public weal.
Forever still the hand that signed with care,
In many reams, papers of great import,
Guiding the task, with judgment rare,
Of many men.
A noble Chief, indeed! Always imbued
With thoughts of duty first, and yet,
A friend to all subordinates.
Perception keen in matters wrong and right,
But slow to judge if some one suffered grief,
This trait revealed that he well knew and understood
The hearts of men.
Of kindly mien and nature most serene,
Unselfishly alert, though sadly handicapped
With impaired health, he heeded Duty's call
And held his post, notwithstanding
A change of clime might have prolonged
His years. He labored on to end the many tasks
Entrusted to his care, problems he understood.
A sacrifice, indeed.
Our Chief is dead! And yet his works remain,
A monument, a memory, a fame;
An inspiration true to greater deeds.
And though we mourn his death, a cheering thought
Comes to us with grief;
That in the Realm to which his soul has fled,
He has received the just reward
That God reserves
For men who love their fellow men.
Our Chief is dead.

MISCELLANEOUS

Dr. Mohler Appointed Chief of Bureau. Secretary of Agriculture D. F. Houston on December 10 appointed Dr. John R. Mohler to be Chief of the Bureau of Animal Industry in succession to the late Dr. Melvin. As is well known, Dr. Mohler has for several years been Assistant Chief of the Bureau, and for a considerable part of the time lately has been Acting Chief owing to the indisposition of the late Chief.

The prompt filling of the vacancy, it is felt, is in line with the Secretary's policy that there shall be no impairment of the Department's efficiency at this critical time in the Nation's history.

Dr. Mohler has been in the service since 1897. Besides serving as Assistant and Acting Chief of the Bureau in recent years he has been chief of the division of animal pathology. Dr. Mohler's wide acquaintance with the veterinary profession, the esteem in which he is held, his practical experience and his rare personal qualities admirably fit him for the position. The Department of Agriculture is to be congratulated upon securing his services.

—The mid-winter meeting of the Montana Veterinary Medical Association will convene in Great Falls on January 25-26, 1918.

—U. S. Veterinary Inspector E. B. Parker has been transferred from Eupora, Miss, to Coalgate, Okla.

—Dr. W. E. Bachelor has removed from Millen to Douglas, Ga.

—The formal opening of the Alexander Liautard Library occurred on the evening of Dec. 5, 1917, at New York University. Addresses were made by Doctors Berns, Munn, Smith, Cochran and Dean Hoskins. The latter stated that Dr. Liautard's gift consisted of three thousand rare volumes to form the foundation of the library and that in addition to the veterinary, the medical and allied professions are included in the cordial welcome to come and use it. Since the formal opening, the veterinary library of the late Dr. Roscoe R. Bell and a full set of Percival's Hippopathology, edition of 1849, the property of the late Professor James L. Robertson, have been added. Two other libraries are about to be added for the benefit of the profession.

—At a recent meeting to effect the permanent organization of the Bay Counties Veterinary Medical Association, California, the following officers were elected: President, Dr. H. A. Spencer, San

Jose; Vice-President, Dr. G. H. Hart, Berkeley; Secretary-Treasurer, Dr. C. C. Wing, Oakland.

—Dr. O. S. Crisler, formerly at Lexington, Ky., is Superintendent of Hog Cholera Serum Production in the Veterinary Department at the University of Missouri, Columbia, Mo.

—Dr. L. J. Anderson has resigned as Dean of the San Francisco Veterinary College and is now in charge of the Agricultural Department of the El Dorado County High School at Placerville, Calif.

—U. S. Veterinary Inspector H. E. Smith, formerly at Indianapolis, Ind., is now in the service of the Dairy Division of the Bureau of Animal Industry at Washington, D. C.

—Dr. Chas. S. Chase of Bay Shore, L. I., was elected president of the Veterinary Medical Association of New York City at its December meeting.

—Dr. V. E. Tanner has removed from Morse to Broadview, Saskatchewan, Canada.

—Dr. C. H. Dibbell has purchased the office and practice of the late Dr. E. F. Koehler, Easton, Pa.

—Dr. M. W. Scott, formerly at Vincennes, Ind., is now stationed at the Live Stock Exchange at East St. Louis, Ill.

—Dr. Fred Molt has removed from Big Spring, Texas, to Quinton, Okla.

—Dr. H. D. Wilkinson has removed from Chicago, Ill., to Toms River, N. J.

—Dr. W. A. Boucher has removed from Pasadena to his 300-acre bean ranch at Jamul, San Diego Co., Calif.

—Dr. R. E. Boxmeyer, formerly with the State Serum Plant at Little Rock, Ark., has removed to Holden, Mo.

—Dr. H. W. Tillson, formerly at Oneonta, has removed to Delhi, N. Y.